

# CONTRACTORS and ENGINEERS

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SCIENCES

LINE OF MODERN CONSTRUCTION

DECEMBER 1961



Production:  
21 floors a week

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This new 60-ton tractor is so different there is

# nothing like it

in design, or in performance on push-loading and dozing work

For two years on several multi-million-yard earth-moving jobs a new idea in push-loading has been under extensive and sustained operation behind a variety of scrapers. This new idea is the HOUGH D-500 PAYDOZER—a different and better kind of rubber-tired pusher and dozer as shown by its performance on these projects.

**More Power.** A 700 hp turbo-charged V-12 Cummins diesel is governed to 2100 rpm and 600 hp for longer life and lower maintenance. Two newly-developed, high-efficiency dry-type air cleaners plus filtration of all oil circuits are provided for complete engine protection.

**Articulated Hydraulic Steering** is one of the most unusual features and gives exceptional maneuverability. The turning radius is under 25-ft.—considerably less than its overall length and one-third less than a comparable unit with rear-steer. The rear wheels always track the front ones and always follow in the path cut. Combined with 30° rear-axle oscillation, this articulated steering keeps “all four feet” on the ground and also permits a twisting “walk-out” action when poor footing is encountered.

**Wide-range Drawbar Horsepower.** The power train includes a 3-stage, single phase, torque converter, a HOUGH-built full-power-shift transmission, power-transfer differentials in both axles and planetary hubs in all wheels. This drive train provides 80% of peak drawbar horsepower available over 75% of the entire speed range so it can push-load efficiently with a wider range of scraper sizes.

**“Keep-clean” Hydraulic System** is closed and pressure-controlled to give it maximum protection against air-borne dust and moisture, and to eliminate oil foaming. Extensive screening and filtration of the oil also prolongs the life of hydraulic mechanisms.

**Three-way Blade and Push Block.** Blade is 160" wide—extending 10" beyond the wheel path on each side, and has special reinforced center area for pushing. Six-way hydraulic control includes raise, lower, tilt to each side, forward and backward pitch. Modified wings help retain



the load while adjustable stabilizer shoes permit precise grade control. A separate pusher block is optional.

**Unusual Stability and Smooth Riding** are features the operator will notice and appreciate. These are achieved by the approved use of dry ballast material (100% heavier by volume than liquid) in all four tires. It lowers the center of gravity and also reduces the bouncing action usually found in unsprung machines. Standard tires are 33.5 x 33-26 PR, with options including 37.5 x 33. The powerful 4-wheel brakes are air-controlled with dual brake pedals for operator convenience.

**High Availability.** One example of the many extra features in this unit to keep it profitably at work and reduce downtime is the separate fan-cooled oil-to-air cooler to effectively control transmission-converter oil temperatures. Full-shift fuel capacity is provided. An optional central lubrication system can be furnished that automatically lubricates 27 different points every 30 minutes of operation.

Your HOUGH Distributor is ready to give you the whole story—why there is nothing like the D-500 PAYDOZER.

<b>THE FRANK G. HOUGH CO.</b>		12-B-1
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Please furnish complete data on the D-500 PAYDOZER		
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Title _____		
Company _____		
Street _____		
City _____	State _____	

 **THE FRANK G. HOUGH CO.**  
LIBERTYVILLE, ILLINOIS  
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ROUGH,  
and PAY

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Before you buy any tractor-shovel in the 2 to 3 cu. yd. class consider the

# availability

designed into this new Model H-70C

You can't make money when your equipment is idle. "Down-time" is more costly in terms of lost production or yardage than it is in repair and parts costs. Machine availability—time on the job—is therefore one of the most important considerations when selecting any equipment.

That is why HOUGH engineers have designed into this new H-70C, features that insure maximum job availability . . . features made possible only by HOUGH's long, extensive experience . . . features not found in any other tractor-shovel in the industry.

**Heavy duty Design and Construction:** This new H-70C weighs a full 22,000 lbs. without ballast, and is built around a massive structural steel frame—twist-proof and shock-proof—to keep all components in alignment. The huge, heavy-duty axles specifically designed for tractor-shovel service, the precision-engineered HOUGH-built transmission, the dependable engine with plenty of reserve power, and the most effective hydraulic system, all combine to provide utmost dependability and freedom from breakdown on the job. And in addition, in the production and assembly of all HOUGH machines, components and complete machines are fully tested by the most modern scientific instruments available—including final chassis dynamometer testing.

**Less Maintenance Required:** The simplicity of PAY-LOADER design, plus the special attention given to protecting points of normal wear, cut "down-time" and maintenance costs tremendously. The simplified boom mechanism has as many as ten fewer pivot and grease points than other tractor-shovels, which means fewer parts to service and maintain.

A single bucket-control cylinder cuts in half the number of cylinders, piping, hoses, linkages and wear points found



on all other tractor-shovels. In addition, pivot points on boom, bucket mechanism and steering are fitted with "O" rings and other seals that keep dirt out and grease in.

Front wheel brakes are sealed against dust and dirt. The hydraulic system is closed and pressure-controlled to exclude even air-borne dust and moisture. A large-capacity two-stage, dry type, air cleaner protects the engine even under the most adverse conditions.

**Faster and Easier to Service:** No other tractor-shovel provides the easy, time-saving access to all machine components for inspection, service, repair or maintenance. Large, removable engine side covers expose the entire engine for easy access unobstructed by fenders, hydraulic cylinders or other components. Easily-removed access panels allow quick checking of oil levels, checking and adjustment of operating and hydraulic controls, batteries and other essential components. The low-mounted fuel tank is refilled from ground level and has full-shift capacity.

The cylindrical-vessel-type oil reservoir is outside-mounted and has a full-diameter cover that is easily removed for complete inspection and servicing of its two full-flow micron filters.

Only a PAYLOADER gives you simplicity of design, the built-in protective features, the ease of accessibility that means more hours on the job, and also more yardage per hour. Only the model H-70C gives you a tractor-shovel with all these PAYLOADER advantages, plus more horsepower per pound, more dumping clearance and more reach than the average of all tractor-shovels in its class. Your HOUGH Distributor will be glad to tell you more about it and show you what it can do.

 **THE FRANK G. HOUGH CO.**  
LIBERTYVILLE, ILLINOIS  
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**THE FRANK G. HOUGH CO.**  
762 Sunnyside Ave., Libertyville, Illinois

12-B-3

Send full data on Model H-70C 2½ yd. PAYLOADER

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

# CONTRACTORS and ENGINEERS

MAGAZINE OF MODERN CONSTRUCTION

DECEMBER, 1961

A Bittenheim Publication

## Apartments go up 21 floors a week

- 14 This high rate of production is maintained on a \$70 million public-housing project in Chicago by carefully organizing the right equipment and a 2,000-man work crew.

## Strip rig saves time on 2 bridges

- 34 A highly maneuverable work platform, built by the contractor for about \$10,000, travels on rails under its own power; it can be raised 3½ feet and can swing 270 degrees.

## Pipe laid in 157-foot sections

- 42 To save time and money laying a crude-oil pipeline, the Poles are triple-jointing pipe with automatic welding machines at a base camp, rather than in the field.

## Dam to have permanent frozen core

- 48 Through a system of simple heat exchangers, an Alaskan contractor plans to utilize the Arctic cold to help form an impervious central core for a 145-foot-high gravel-fill dam.

BRIDGE 38 Thick ice helps contractor driving cofferdam

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The American City	OVERVIEW	MART	Municipal Index	AMERICAN SOCIETY OF CIVIL ENGINEERS
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CONTRACTORS AND ENGINEERS

### COVER:

An average of 21 floors is being completed weekly for an apartment-house complex in Chicago. To maintain this production, some 23 cranes and 2,000 men are on the job. The Bucyrus-Erie Super 38-B buckets concrete to a twelfth floor; bricklayers work from hanging scaffolding lower down. Supplies are lifted to working floors by a Beaver-Advance double tower.

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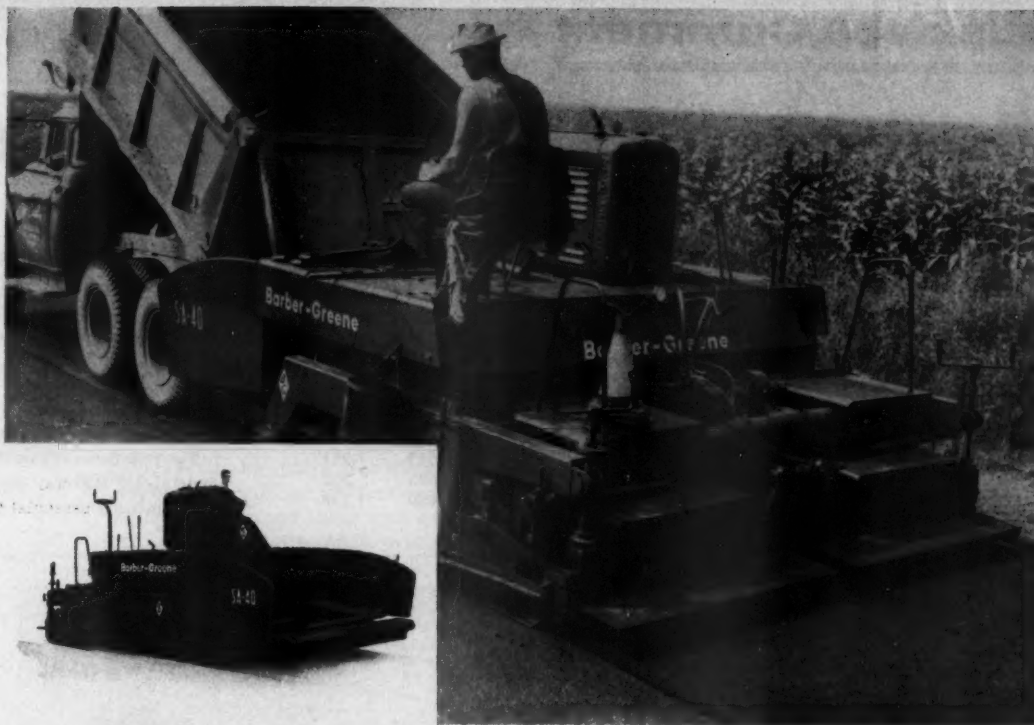
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## New Barber-Greene SA-40 Finisher

*...newest advance in asphalt paving equipment*

Barber-Greene's Model SA-40 is a new achievement in ease of operation and automatic features, combined with simple construction for greatest accessibility and ease of maintenance.

Its wide range of speeds from 12 fpm to over 4 mph with top speeds for both forward and reverse, together with its many other features assure greatest tonnage production at lowest cost.

#### OUTSTANDING FEATURES INCLUDE:

- **NEW EASE OF OPERATION** with joystick, power-assist steering.
- **HYDRAULICALLY SELF-DUMPING HOPPER.** Tunnel extends to rear of chassis for greatest capacity.

capacity. Hopper gates controlled from screed platform.

- **HEAVY-DUTY LONGER LIFE SCREED** features hydraulic operation, high speed tamper that compacts before strike-off, improved automatic leveling, twin heaters.
- **AUTOMATIC FEEDER CONTROL** operates each pair of feeders and screws independently.
- **OSCILLATING PUSH ROLLERS** pick up trucks on-the-fly regardless of alignment.
- **SIMPLIFIED SERVICING** achieved through unitized construction and simple, efficient, accessible power train.

World's No. 1 Manufacturer of Asphalt Paving Equipment

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For more facts use Request Card and circle No. 253

## In coming months

White blacktop—that's the newest word in bituminous-concrete paving. A synthetic bitumen, capable of being mixed with aggregate in a regular plant and laid by equipment now in standard use, is being tried out on paving projects in several states, and early reports are that the material has plenty of advantages. Bill Allen's feature story goes into evaluations of recent projects using the mix, the combining of the ingredients, modifications needed at the asphalt plant, and precautions necessary in successfully laying the material down on a roadway.

sponded to our call for their newest literature, so look for a valuable listing in January's issue.

January is traditionally the month in which the forecasters predict the kind of business year we can expect. Our Washington correspondent, E. E. Halmos, Jr., is busy interviewing the important figures in construction, finance, and allied areas of the industry for a straightforward article next month.

Every contractor worth his salt is taking a long, hard look at business with an eye to tightening up operations and cutting costs. C&E is taking a nationwide survey to determine what aspects of their business contractors feel most need this attention, and a feature article will report on the results.

## C&E to publish AED Daily for 5th consecutive year

The five-year mark isn't much of a milestone in publishing circles (C&E will be going into its 41st year next month, for instance), but we're proud all the same to announce that our *AED Convention Daily* will be published the end of next month for the fifth consecutive year.

CONTRACTORS AND ENGINEERS publishes this convention newspaper each year during the Annual Meeting of Associated Equipment Distributors. The 1962 *Daily* will be published January 29, 30, and 31 in Chicago, scene of the convention.

Copies will be delivered each morning to the hotel rooms of over 4,000 dealers and manufacturers expected to attend the convention.

Reader response to our Special Reference Section provided to product literature in last January's issue was so good that we've decided to offer another such section again this year. Manufacturers of all kinds of construction machinery and materials have re-

DECEMBER, 1961

# See five-year rise in road obligations

FEDERAL-AID HIGHWAY PROGRAM  
ESTIMATED OBLIGATION OF FEDERAL AND STATE MATCHING FUNDS  
FISCAL YEARS 1962-1966, INCLUSIVE  
(Millions of dollars)

Fiscal year	ABC projects		Interstate projects		Other		Total	
	Federal	State	Federal	State	Federal	State	Federal	State
1962	875	875	2,454	273	31	—	3,360	1,148
1963	905	905	2,601	289	36	—	3,542	1,194
1964	925	925	2,574	286	36	—	3,535	1,211
1965	925	925	2,673	297	37	—	3,635	1,222
1966	950	950	2,772	308	38	—	3,760	1,258

Source: Bureau of Public Roads.

The Bureau of Public Roads has made a new estimate of the rate at which federal and state matching funds for highway work will be "obligated" in the next 5 fiscal years.

Funds become obligated to projects when the bureau authorizes a state (1) to advertise for bids on roadway or bridge construction, (2) to proceed with survey or design work, or (3) to acquire the necessary right-of-ways. As such, the obligation rate is a basic indicator of the trend of road-building volume.

The new figures show the effect of the refinancing provisions of the Federal-Aid Highway Act of 1961. This law, which rescued the road program from perennial threats of spending cutbacks, provided \$1.5

billion in additional interstate funds. It also called for an increase in interstate, ABC funds, with apportionments set at \$925 million in fiscal 1963 and \$25 million higher every succeeding 2 years until expenditures reach the \$1 billion-a-year level.

But for the new law, expenditures would have inevitably crippled the road program. Fiscal year 1961 (which ended June 30 of this year) saw interstate money apportionments shrink by \$400 million down to \$3.2 billion. Fiscal 1962 apportionments rebounded to \$3.2 billion, but 1963 funds would have been \$400 million short again. In fiscal 1964, under the original financing arrangement, there would have been money enough in the trust fund to finance just \$1.5 billion of interstate construction.

The new estimates of the rate at which road-building funds will become obligated indicate that the industry can now look forward to a steady growth in work volume over the next five years. The bureau expects total obligations to increase from \$4.5 billion in the fiscal year ending June 30, 1962, to \$5 billion in fiscal 1966—a steady rise of something over 11 per cent.

These figures include federal and state matching funds for interstate, ABC, and other road systems. (The "ABC" system includes primary roads that are not designated interstate routes and secondary farm-to-market roads.)

Over 80 per cent of obligated interstate money enters the contract construction market directly in the form of payments on contracts. Another 5 per cent goes for construction engineering, an average of 2 per cent is charged to preliminary engineering, and 12½ per cent to right-of-way purchase.

The disposition of obligated ABC funds is: over 86 per cent for construction contracts, 5 per cent for construction engineering, 1½ per cent for preliminary engineering, and 7 per cent for right-of-way purchase.

While the volume of new highway construction continues to expand, road contractors can also look to the road maintenance program as a growing source of work volume. At present about \$2.5 billion a year is spent for road maintenance operations. This program is increasing at the rate of \$100 million a year.



★ Bores horizontal or inclined holes 6" to 60" in diameter—over 300' long

★ Bores up to two feet per minute

★ Jacks casing hydraulically as it bores

★ Bores under streets, walks, railroad tracks, airport runways without obstructing traffic

NOW two men and one machine—a Calweld Horizontal Boring Machine—can install underground pipe or conduit faster and easier than a whole crew using conventional methods. There is no surface ditching, no back-filling, no resurfacing. The Calweld machine drills under thoroughfares without disturbing the surface or disrupting traffic...bores small holes or big holes fast and drives the casing as it bores.

A combination of high torque plus powerful hydraulic thrust drives the rugged drill head through the toughest, hardest earth. Powerful 120-H.P. industrial engine with 4-speed transmission produces a maximum torque of 15,000 to 19,000 foot-pounds. Massive hydraulic

rams exert a forward thrust of 100 to 300 tons. Rams telescope to 12 feet and are easily retracted for adding the next section of flight conveyor and casing. Continuous auger-type flight conveyor carries loosened material back to the work pit. The machine can be used without drill head or flight conveyor to jack concrete pipe into pre-dug holes.

Calweld Horizontal Boring Machines are completely self-contained. There are no tracks to lay; no auxiliary hydraulic equipment, air compressor, or power supply are required. Three models handle casings from 6" to 30", 8" to 42" and 10" to 60" in diameter, respectively.

Special tunneling machines built to specifications.

Write today for complete illustrated literature and prices.



For more facts use Request Card and circle No. 254



## Getting the facts

What do the people of the state really think about their highways? What improvements do they want? How soon do they expect these improvements? How much are they willing to pay? These and many more questions went



through the mind of Thurman Sherard as he took over the duties of Director and Chief Engineer of the Alaska Division of Highways. He had some reports of testimony submitted at public hearings and of complaints and requests that came through regular public channels. But these, he believed, might not tell the real story. He set out to get the facts for himself.

Traveling as ordinary tourists in their own automobile with unofficial license plates, he and Mrs. Sherard spent two weeks covering most of the highways throughout the huge new state. Stopping at literally hundreds of restaurants, service stations, hotels, motels, and road houses, he always led the conversation around to highways. In Alaska, this was not difficult to do, since the highways are among the state's vital needs and the subject of much discussion.

"These roads are certainly rough," he would comment over a cup of coffee at a roadside cafe.

Such a remark frequently brought a stinging reprimand from a local citizen. "These roads are all right, if you tourists just wouldn't drive so fast. You know, we're a new state and don't have the money to build a lot of fancy highways." This was sweet music to the ears of the man who was trying to tell people exactly that.

From Ketchikan to Nome, the responses of citizen, businessman, and tourist had one thing in common: they contradicted the official reports, as he had suspected they would. These people were not expecting miracles or huge handouts of money.

He found that most of them realized the difficulties under which a new state and a new department operated. They did not expect a new system of highways overnight. They knew that highway funds were extremely limited in view of the tremendous needs. They wanted an orderly program of new road construction integrated with a systematic improvement of existing substandard roads. And they were willing to pay a just share of the cost.

This kind of reaction was quite the reverse of many reports Sherard had read, which apparently reflected the demands and complaints of those who were dissatisfied and expected the advent of statehood to produce miracles.

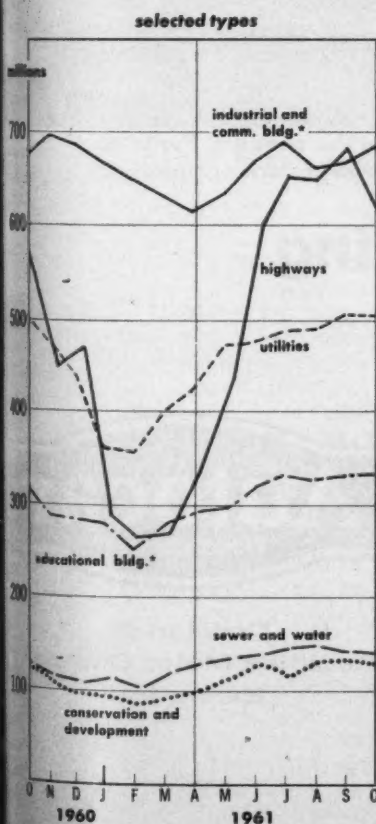
As a result of this one-man survey by a top official traveling as a tourist, the Alaska Division of Highways has a sound basis on which to plan its program and a valuable background for evaluating the findings of future hearings and reports.

What do the people of your state really think about their highways?

## Industry Trends

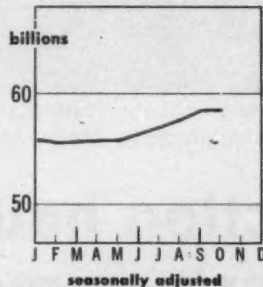
### DOLLAR VALUE OF NEW CONSTRUCTION

Recent Monthly Trends  
(current dollars)



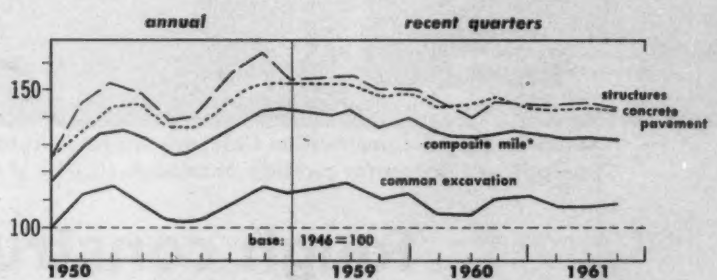
Source: Bureau of the Census

1961 annual rate



### AVERAGE BID PRICES

Federal Aid Highway Construction

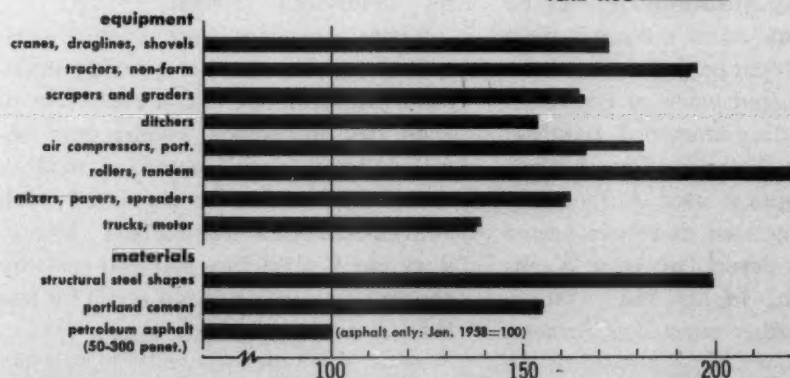


\*Composite mile=17,491 c.y. exc.; 3,726 s.y. paving; 16,000 lbs. reinf. steel; 4,325 lbs. struct. steel; and 68 c.y. struct. conc.

Source: Bureau of Public Roads

### PRICE INDEX 1947-1949 = 100

SEPTEMBER 1961  
YEAR AGO



Source: Bureau of Labor Statistics' Wholesale Prices and Indexes



**Autocar**  
"World's Finest"

American Pipe & Construction Company operates Autocars over the vast stretches of the West and Far West. One primary reason for recently ordered A-10264's is the outstanding WHITE-AUTOCAR service organization.

## Tough construction hauling built Autocar's name

And WHITE-AUTOCAR comprehensive service backs up Autocar's fame as the "World's Finest". It's a combination that makes Autocar pay off most profitably in the rugged work of construction and building-material hauling.

For example, American Pipe & Construction Company uses Autocar A-10264's to cover vast distances across the California desert, up into Washington, Oregon, Idaho and western Canada, with other runs over Arizona

and New Mexico. This is no country for "tenderfoot" trucks!

These Autocars were custom-engineered for American to provide maximum performance and a reduction of 2500 lbs. in chassis weight over so-called "equivalent" standard models.

Combine greater payload with WHITE-AUTOCAR specialized heavy-duty truck servicing, and you see why construction men hate to settle for less than Autocar.



Division of  
The White Motor Company  
Exton, Pa.

For more facts, use Request Card and circle No. 255



# Surveying Washington . . .

by E. E. Halmes, Jr.

Something suspiciously close to "thought control" has been—once successfully—in the current integration campaign of minority racial groups, and directly involves the construction industry.

A New Orleans contractor's \$200,000 contract for work on an ordnance depot is to be "renewed" by the National Aeronautics and Space Administration after charges that a principal officer of the firm made "derogatory" remarks about racial groups in a local debate over school integration. And in Washington, D. C., a well known housing contractor, with a 50-year record in

ton his lips on all controversial matters, regardless of his rights as a citizen.

• • • • •

A hopeful sign for building contractors is the changing attitude of unions toward research and the acceptance of new techniques. John J. Murphy, president of the Bricklayers, told the Structural Clay Products Institute that his members "welcome" the chance to do better work—and keep their jobs. He praised the SCPI-developed "corner pole," which is said to eliminate the need to lay building corners first as a guide for middle brick courses. Bricklayers who first objected to this time-saving device now accept it.

• • • • •

Contractors still plagued by the ambiguity of state and city laws on out-of-state corporations may get a break from new hearings starting early this month before the House Judiciary Committee. Committee-men hope to come up with a definition of taxable income, to decide what firms may be subject to state and city income levies, and possibly even to announce a uniform national formula for application of such taxes. The 2-year-old law protecting firms that only solicit business in other states has not helped contractors very much.

• • • • •

Government contracting departments want to put onto prime contractors the burden of settling contractual disputes with their subs. Speakers at a recent meeting on government contracting procedures stressed that the government believes the prime knows more about his subs—what they're doing and how they're performing—than anyone else, and that it is up to the prime to handle their complaints.

• • • • •

The Highway Research Board has released the first three sections of its long-awaited report on the Ottawa, Ill., test road. Don't expect anything startling because they simply report on organization,

operation, and construction of the test loops. No results are given. These will be issued in the coming months.

HRB has started a long-planned expansion program to aid manufacturers of equipment, materials, and other products in highway-related industries by collecting and publishing research findings in this area. A larger engineering and research staff and new publications will be paid for with \$125,000 supplied by the Bureau of Public Roads and member highway departments of AASHTO, plus \$1,000 in annual dues from a newly created "industrial associate" membership category.

• • • • •

The to-do over bomb and fall-out shelters in many urban areas is worrying contractors as well as government agencies. In the Washington metropolitan area alone (about 1.5 million population) only 27 building permits have been issued for construction of family shelters, but officials know that more than 300 have actually been built or started.

The trouble is the swarms of fly-by-night promoters who know little about sound construction



practice and less about proper equipment for such shelters. They take advantage of the fact that many home owners are doing such construction at night for fear of ridicule by neighbors, and that there is little factual information available as to exactly how a shelter should be built and what it should contain. The Associated General Contractors is assembling a study on shelter construction and case histories of shoddy work.

This is expected to do a lot to combat the bad effects of building shelters hurriedly and without adequate preparation.



the city and suburbs, was forced out of a combine that will build apartments in a redevelopment area, because of charges of discrimination in private housing developments. To NASA's credit in the New Orleans case, it must be remembered that the agency backed the contractor despite heavy pressure from minority groups and a Washington columnist. It found that 21 per cent of the contractor's office force and 40 per cent of his labor force was Negro, and that he was well qualified and his aid advantageous to the government.

The significance for contractors, and all businessmen, is the emergence of a sharp new economic weapon in the hands of militant minority leaders. In neither of the cases cited was there any evidence that the firms were not well qualified to do the work, or that either had practiced racial discrimination in its employment policies, or that they intended to do so on any government job.

But remarks and acts in other settings and having no connection with the jobs at hand were used against them. It would appear that, if a contractor wants to do work for the government, he'd best but-

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pany



A dump truck with a built-in asphalt "pot," air compressor, and hand-spraying equipment eliminates one rig for a patching crew and takes a lot of the headaches out of the street maintenance operation.

The rig, designed by Harry Sondgroth and Ray Hamnes and built in the shops of Sondgroth Bros., Mountain View, Calif., is used by a patching crew on the maintenance of streets in new subdivisions where the contractor must guarantee and maintain the pavements for a specified period before they are finally accepted by the city.

Sondgroth had always used the common trailer-mounted asphalt pot.

This rig was pulled by a pickup and was a continuing source of annoyance. It was rough on the pickup which frequently needed a new clutch, transmission, or rear end. In addition, a separate engine and compressor had to provide pressure for the spraying. This little engine was frequently hard to start. Even when

it did start, it was after a long wait until it was enough. After some time, the pickup was added to the patching crew with its own set of tools. This eliminated the need for a separate engine and compressor. As it stands, the built-in rig



## LUBE LOGIC

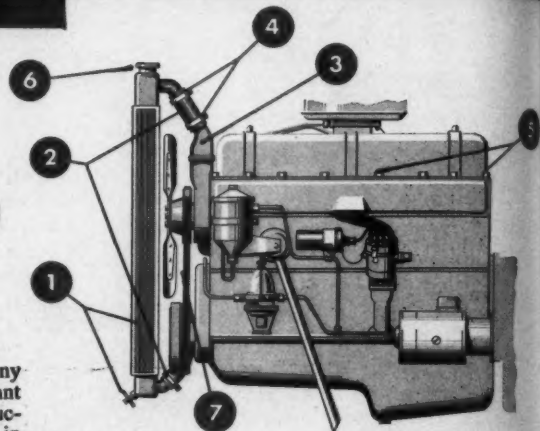
### Antifreeze: what's the best type to use; how to make sure you get maximum protection

It's getting pretty close to antifreeze weather in many parts of the country, which brings up two important points: choosing the best type of antifreeze for construction machinery; and making sure the cooling system is in good condition, so the antifreeze can do its job properly.

The right type of antifreeze is the permanent kind. Construction equipment engines operate best at 180°F jacket temperature which is ten degrees higher than the boil-off point for alcohol. Permanent antifreeze (like Texaco Startex) will stay on the job at the temperature that's best for the engine. Don't substitute salt or kerosene solutions. They won't freeze, true enough, but they're tough on engine components.

It's important to keep the cooling system in good shape for three reasons: first, because antifreeze that gets into the crankcase causes severe varnish deposits on pistons and rings; second, because you want the antifreeze solution to circulate properly; and third, because antifreeze lost through a leak costs a lot more to replace than just plain water. Before you add antifreeze, check the following points:

- 1 Clean the cooling system—drain and flush thoroughly.
- 2 Check the radiator hoses, replace any that are soggy or collapsed.



- 3 Check the thermostat. If the thermostat is in good condition, the thermostat discharge connection will remain closed until the coolant in the water jacket is up to operating temperature.
- 4 Tighten connections on hoses that don't need replacing. Antifreeze can pass through spaces too small for water leaks.
- 5 Tighten cylinder head, oil cooler and other hold-down bolts.
- 6 Check radiator filler cap gasket.
- 7 Inspect and adjust fan belt.
- 8 Now you're ready to put in the antifreeze.

After the antifreeze is in, it's a good idea to:

- 1 Check the level at operating temperature.
- 2 Check for leaks.
- 3 Check water pump packing nut adjustment.
- 4 Check cooling solution with suitable hydrometer to make sure of protection temperature.

### Metal concrete forms can be readied for re-use faster

You can get metal concrete forms cleaned up and back on the job faster if you spray them, before use, with Texaco Stazon. Use the Stazon just as it comes from the container for best results. Field reports say it gives the concrete a fine smooth finish, and the Stazon prevents sticking, shortens clean-up manhours.

### Magneto Lubrication: three IFs and a BUT

**IF** the magneto is oil-lubricated, apply a few drops of oil every 500 hours.

**IF** the magneto is grease lubricated, apply Texaco Marfak Multi Purpose 2 every 100 hours.

**IF** the magneto is located near the engine exhaust pipe, lubricate with Texaco High Temp Grease every 50 hours.

**BUT** if the bearings on your magneto are sealed, follow manufacturer's recommendations and let the distributor do the servicing.



It did start, there was always the delay after the rig reached the job site until the pressure was built up enough to start spraying.

After struggling with these problems for years, Harry Sondgroth decided to eliminate the trailer and pickup by mounting the asphalt pot with its motor and compressor in the back of the dump truck used to haul the patching mix. Before he got this worked out, he came up with the additional feature of a compressor driven by belt from the truck engine. This eliminated the need for a separate engine.

As it was finally built, the rig consists of a rectangular 100-gallon tank built into the front end of the dump

box of a GMC 470 truck. Up under the hood, is a Bendix-Westinghouse compressor belt-driven from the truck engine. This compressor maintains a constant pressure in the sealed tank so that the asphalt can be sprayed immediately when the truck pulls up to a work site.

The discharge hose and hand-spray outfit are coiled on brackets on the side of the truck where they ride out of the way but always handy.

At the start of a work day, the crew men fill the tank with hot asphalt drawn from the storage tanks at the hot-mix plant. Then they take on a load of hot patching mix that will usually last them the best part of a day. Behind the truck they tow a

low trailer on which they carry a small Gallion roller to roll the patches. Once in the subdivision, the roller travels under its own power, using the trailer only for the long hauls.

When the rig was first put into use, the crew experienced a heating problem. The hot asphaltic mix piled against the tank overheated the asphalt in the tank. This was remedied by inserting an extra plate and an air space to insulate that side of the tank.

The pictures in the outside column of page 12 show, first, a workman applying the hot asphalt to a patch while the man on the truck is ready to toss out a shovel full of the hot-mix.

In the second picture, the tank can be seen built into the forward part of the dump-truck box. The vertical pipe at the left side of the box is the fill pipe through which the hot asphalt is put into the tank. A Bendix-Westinghouse compressor up under the truck hood and belt-driven from the truck engine provides pressure for the spray.

The third picture shows the little Gallion that rolls the patches after the material has been shoveled out of the truck and raked smooth by the workman at the left. A patch like this is completed in a few minutes.

Below, is the typical old trailer-mounted pot pulled by a pickup. The separate engine is mounted ahead of the tank on the trailer.

## More efficient equipment performance

Too-thin lubricant may permit metal-to-metal contact.



Too-thick lubricant will hold dirt, pack in gear teeth, may damage bearings.

### Key points in choosing gear lubricant for gyratory crushers

One of the toughest lube jobs on a gear-driven gyratory crusher is the gears themselves. They're partly protected by oil-tight cases and dust rings, but some contamination is inevitable, and it's essential that you choose a lubricant that can take it.

Viscosity is very important. These gears are very heavily loaded, so too-low viscosity may not provide a film thick enough to prevent metal to metal contact. On the other hand, if the lubricant is too thick, it will hold grit and dust in suspension, and let it develop a scoring action on the gear teeth. In addition, dust tends to dry out lubricants, and also creates a "packing" condition between gear teeth. This packing of dust and dried lubricant can build up undue pressure on gears and bearings.

Your best bet is a lubricant with a viscosity between 50 and 160 seconds Saybolt Universal at 210°F, with extreme pressure characteristics. These specifications will get you a lubricant with a good compromise between too thick and too thin. Ask any Texaco Lubrication Engineer to help you pick the right grade for your temperature zone.

### TEXACO LUBRICATION ENGINEERS

Every month or so we'll bring you a batch of "sleepers," little angles, so easy to overlook, where big savings in time and money can be made. If Lube Logic doesn't solve your problems, call your local Texaco man. Anytime, all the time, he's your best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control." Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

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**1. PLAN FOR PROFIT**—Texaco's newest color-and-sound movie. Dramatizes the major savings you can make with the proper investment of less than 1% of your total budget—the amount you spend on lubricants. Film features latest lubrication methods and equipment on a number of contracting projects, demonstrating the Texaco Simplified Lubrication Plan in action.



**2. FUNDAMENTALS OF LUBRICATION**—a brand new Texaco color slide film. A clear, concise once-over that defines technical terms like "viscosity" and explains specifically what lubrication is and what it does. This down-to-earth discussion will give the lubrication man a new understanding of the importance of lubrication, and a fresh interest in his work. It's supplemented with a manual that covers the same ground in greater detail.



**3. LUBRICATION OF EARTHMOVING EQUIPMENT**—a new slide film, in color. A concise, easy-to-understand analysis of proper lubrication of engines, wheel bearings, steering, track rollers, crawler treads, hydraulic equipment, wire rope, open and enclosed gears. Supplemented with a manual that covers the whole field of earthmoving equipment lubrication in greater detail.

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## Portable steel box for winter mortaring of pipe

For mortaring pipe joints in cold weather, Angelo DiPonio, a Detroit contractor, has devised an ingenious system.

A steel box, similar to a truck body, holds all the equipment, as well as the heating devices for the sand and the water. A tractor pulls the box from spot to spot as the work progresses.

At the closed end of the 15 x 8 x 4-foot box is the sand heating and storage area. The sand covers a 1-



foot metal culvert that extends through the width of the box. A Chausse torch-type heater warms the air in the culvert, which is open at both ends.

At the open end of the box is a simple water heater. It consists of a steel unit built to fit around a 50-gallon drum. An oil-fired torch heats the air under and around the drum containing the water. For mixing the mortar, a small Rex mixer is mounted in the box.

The entire unit is pulled from place to place by a cable attached to the closed end of the box. Skids on the bottom of the box make it easier to drag.

In the field the equipment proves ideal for its job.



*With 28 apartment buildings  
going up in Chicago development,  
contractor keeps 23 cranes  
and almost 2,000 men at work*

by BILL ALLEN, field editor

## **Production: 21 Floors a Week**

**A** well organized field force, plus plenty of the right kind of equipment, keeps production rolling at a record pace on a \$70 million public-housing project in Chicago.

Twenty-eight 16-story apartment buildings are going up simultaneously at the rate of about a floor a week. In 5-days' time, it is not unusual for the men and equipment to complete 21 stories on the reinforced-concrete structures.

This kind of production keeps some 2,000 men and 23 cranes shifting from building to building as the work moves skyward. Two gen-

eral superintendents and four job supers organize the work so that there is no lost time. As one crew is picking up tools to leave a floor, another crew moves in.

This is the Chicago Housing Authority's Robert R. Taylor Homes project on South State Street. The general contractor, holding \$54 million in contracts, is Gust K. Newberg Construction Co., Chicago.

Upon completion of the project in 1963, twenty-eight 16-story apartment buildings and three auxiliary buildings will have re-

(Continued on page 16)





# POWER

KEEPS ON WORKING  
AFTER OTHER ENGINES  
HAVE QUIT...

Chrysler Industrial Engines—famous for long life and trouble free performance in the toughest applications—are now powering more, different applications than ever before. Why? Because Chrysler M & I is now offering more models than ever before. Thirty different engines—both gasoline and diesel—all backed by the industry's fastest and best field service network and warranty—all priced to reflect the mass production capacity of Chrysler Corporation.

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## 30 CHRYSLER INDUSTRIAL ENGINE MODELS

	MODEL (Gasoline)	NO. CYL.	DISP. (Cu. In.)	WEIGHT (lbs.)	GROSS TORQUE (FL Lbs.)		GROSS HORSEPOWER		CONTINUOUS H.P. @ recommended rpm*
					@ 1200 rpm	MAX.	@ Rated rpm*	@ 1200 rpm	Peak Torque @ Peak Torque Rated*
GASOLINE	CH-170	6	170	420	148	136 @ 4000	34	46 @ 1600	48 @ 2800
	CH-170	6	170	420	148	136 @ 4000	34	46 @ 1600	48 @ 2800
	CH-170	6	170	420	148	136 @ 4000	34	46 @ 1600	48 @ 2800
	CH-230	6	230	575	190	144 @ 3600	43	43 @ 1200	73 @ 2800
	CH-230	6	230	610	190	144 @ 3600	43	43 @ 1200	73 @ 2800
	CH-230	6	230	610	179	156 @ 3200	41	48 @ 1500	73 @ 2800
	CH-265	6	265	740	225	175 @ 3600	51	51 @ 1200	88 @ 2800
	CH-265	6	265	760	225	175 @ 3600	51	51 @ 1200	88 @ 2800
	CH-265	6	251	760	196	167 @ 3200	45	49 @ 1300	78 @ 2800
	CH-225	6	225	475	204	157 @ 4000	47	47 @ 1300	61 @ 2800
	CH-225	6	225	475	204	157 @ 4000	47	47 @ 1300	61 @ 2800
	CH-225	6	225	475	204	157 @ 4000	47	47 @ 1300	61 @ 2800
	CH-318	8	318	550	256	246 @ 4000	60	125 @ 2400	84 @ 3200
	CH-318	8	318	550	256	246 @ 4000	60	125 @ 2400	84 @ 3200
	CH-318	8	318	550	256	252 @ 4000	62	130 @ 2400	90 @ 3200
	CH-318	8	318	550	258	250 @ 4000	60	125 @ 2400	96 @ 3200
	CH-361	8	361	610	299	275 @ 4000	69	149 @ 2400	101 @ 3200
	CH-361	8	361	610	314	265 @ 4000	70	151 @ 2400	110 @ 3200
	CH-361	8	361	610	311	290 @ 4000	73	155 @ 2400	110 @ 3200
	CH-413	8	413	710	316	262 @ 4000	72	128 @ 2000	142 @ 3200
	CH-413	8	413	625	346	324 @ 4000	82	190 @ 2600	127 @ 3200
	CH-413	8	413	625	342	290 @ 4000	76	170 @ 2400	160 @ 3200
	CH-413	8	413	625	345	333 @ 4000	87	183 @ 2400	160 @ 3200
	CH-413	8	413	730	344	284 @ 4000	78	142 @ 2000	154 @ 3200
DIESEL	CH-99	4	99	330	73	69 @ 4000	17	32 @ 2100	34 @ 3000
	CH-144	3	144	456	120	100 @ 2400	27	29 @ 1250	33 @ 2000
	CH-203	4	203	520	163	120 @ 3000	39	32 @ 1000	47 @ 2000
	CH-270	4	270	722	222	210 @ 2000	51	55 @ 1300	57 @ 2000
	CH-305	6	305	702	242	176 @ 3000	57	37 @ 1000	71 @ 2000
	CH-354	6	354	836	300	245 @ 2800	70	88 @ 1500	85 @ 2000

• Send for detailed specifications, power charts, installation drawings on any model.

\*Ratings shown are for standard specifications.

†Military QPL Engines

For more facts, use Request Card and circle No. 256

(Additional photo on front cover)

of the buildings in the new apartment  
is this one, with elevator shaft bisect-  
ing wall of the structure. A Bucyrus-Erie  
crane is hoisting transit-mix concrete to  
fourteenth floor while a Bantam T350  
handles 10-inch steel pipe for the un-  
derground hot-water heating system.



Materials other than concrete and steel are handled by this Beaver-Advance double tower powered by an American 2-drum hoist. Mortar is mixed on the ground and hoisted in wheelbarrows to the floors.

(Continued from page 14)

placed 95 acres of dense slum area. The buildings will contain 4,415 individual apartments. The development lies between State Street and the Rock Island Railroad tracks, from 39th Street to 54th Place.

#### Construction

Shaw, Metz & Associates, architects and engineers of Chicago, designed the low-rent apartments to give the most for the construction dollar. Construction is straightforward, and methods are time-tested. The 8-inch flat-slab floors are simple to form. Since the utilities and electrical connections are buried in the concrete floor, there is no need for a false ceiling. Masonite forms for the

floor and plastic-coated plywood forms for the columns make it possible to paint over the concrete for the finished surface.

Exterior walls are of maintenance-free brick and block. Sliding windows in aluminum frames provide adequate light for the 3 and 4-bedroom apartments that make up the building units.

In a departure from previous buildings of this type, the project will have plaster rather than concrete-block interior walls. This is primarily a matter of price. Sprayed-on plaster with metal studs has become competitive with concrete block.

The central heating plant for the project is one of the most modern in

the country. It heats water under pressure to temperatures of nearly twice the boiling point (400 degrees). It pumps the high-temperature water through an insulated underground piping system to the various buildings. Water circulates through coils embedded in the concrete floor to heat the rooms. Equipped with flame combination gas and oil-fired burners, the plant has a capacity of 14,000 horsepower.

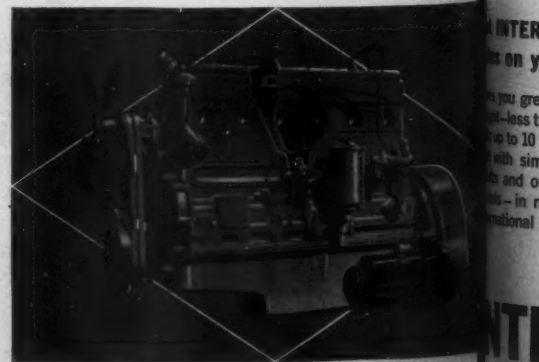
In the fall of 1960, the Chicago Housing Authority awarded three contracts in close succession for the first three stages of construction. The fourth-stage construction was let in July of this year. Newberg was low bidder on all four contracts. Totalling \$54 million, the four contracts involve construction of twenty-eight



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One of the Bucyrus-Erie cranes places concrete for a column. The next step will be to set reinforcing steel and electrical conduits.



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ary apartment buildings, a main-  
management building, a  
community building, and a power  
plant.

#### Buildings identical

Except for the color of the outside  
brick, all of the apartment buildings  
are identical. All twenty-eight are  
going up at the same time at about  
the same rate of speed. This mass  
construction allows Newberg to real-  
ize economies in buying materials.  
The similarity of the buildings al-  
lows for extensive re-use of forms.  
Crews become familiar with estab-  
lished work patterns and get the  
job done faster.

Thirty-one buildings going up at  
the same time also creates certain  
problems. Organizing the efforts of

the vast number of men and ma-  
chines necessary for this volume of  
work requires a considerable amount  
of supervision. Newberg, whose forces  
do all the concrete work, often has  
over 800 men on the payroll. With  
close to 60 subcontractors on the  
job, the total number of workers on  
the project approaches 2,000.

To handle the supervision, the job  
is split up by contract into four sec-  
tions. A job superintendent is re-  
sponsible for the work on each of  
the four contracts. Coordinating the  
work of the four contracts is a gen-  
eral superintendent. Working out of  
a central field office, the general  
super lives with the job.

When concrete is being placed di-  
rect from bucket to forms, it takes  
a lot of cranes to put up 28 build-

ings. Newberg keeps 23 cranes on the  
job. Primarily Bucyrus-Erie rigs,  
they range in size from mobile 22-B's  
to hefty 54-B crawlers. Most of the  
cranes must be able to handle enough  
stick to reach the upper floors of the  
140-foot-high buildings.

Generally two cranes—and some-  
times as many as four—handle the  
forms, steel, and concrete for the  
working floor of a building. Using  
1½-yard buckets, the cranes swing  
the concrete from transit-mix trucks  
directly to the forms.

Materials for the trades working  
the lower floors are handled by a  
Beaver-Advance double tower pow-  
ered by an American 2-drum hoist.  
A fork-lift feeds brick and concrete  
block to the elevator, which carries

(Continued on next page)



# YOU'RE READY TO ACT RIGHT NOW!

#### How to get the jump on early Spring operations:

Combine the proven power of an INTERNATIONAL Red Diamond engine with the sure traction of a rugged INTERNATIONAL tandem axle and you can stop worrying about unpredictable Spring weather. For example, they call the rugged Model RF-190, shown here, practically bog-down-proof. The broad INTERNATIONAL line of 6-wheelers is available with gasoline, diesel or LPG engines to 262 hp. GVW's from 22,000 to 73,000 lbs.

INTERNATIONAL designed-and-built tandem  
on your job — warranted for 100,000 miles

you greater torque and load capacities—more savings in  
less truck wear and tear! Induction-hardened axle shafts  
to 10 times more resistance to shock loads. Lightweight  
simplified power divider and through-drive design.  
and other parts interchangeable between axles. Three  
in ratings of 30,000, 34,000 and 38,000 lb. capacities.  
International Harvester Co., Chicago, Ill.



# INTERNATIONAL® TRUCKS

WORLD'S MOST  
COMPLETE LINE **IH.**

For more facts use Request Card and circle No. 257



Both crane and elevator tower hoist  
materials to the working floors. The  
B-E 51-B buckets concrete and han-  
dles forms and reinforcing steel. The  
Beaver-Advance double tower han-  
dles masonry supplies and equip-  
ment for other trades on lower floors.



Inside the high-temperature (400-de-  
gree) water heating plant that will  
supply heat to all buildings in the  
project, a welder makes a joint in the  
gas line that will fire the boilers. The  
plant also can make use of oil for  
heating purposes.

(Continued from preceding page)

the materials to the desired floor. Mortar is mixed at ground level and then raised in a wheelbarrow.

When the structure is up to about the eighth floor, the bricklayers start enclosing the building. Total bricklayers on the job: about 350. Total bricks: 10 million.

Forming the rectangular columns and flat floors moves swiftly with crews shifting from building to building. Columns are formed with plastic-coated plywood held together by Des-Lauriers right-angle column clamps.

Floor forms are of 1/4-inch Ma-

sonite backed by closely spaced 2 x 4's laid flatwise. For ease of handling, the 14-foot-long 2 x 4's are nailed together in groups of four. The 2 x 4's rest on bar joists. Vertical shores are 4 x 4's with adjustable Ellis clamps.

With the floor forms set and the columns poured, men start to place the reinforcing steel, conduits, and copper tubing for the radiant heating. Steel screed bars are set to control the finish elevation of the floor.

As the concrete is bucketed to the forms, it is vibrated. Two men pull a

16-foot wood screed to strike off the surface. After the coarse stone is knocked down with a "jitterbug," the mix is floated with wood and steel hand floats. When the mix sets up enough, machine float and finish rigs work the surface. Finally, the concrete is given a hand-trowel finish and sprayed with curing compound.

With two cranes placing concrete, two crews can put down a floor (330 cubic yards) in less than four hours. In a week's time, the transit-mix trucks of Material Service Corp. unload as much as 7,000 cubic yards of concrete. On a good day, 2,000 yards of concrete move from truck to forms.

Total quantities indicate the size of Newberg's job: 150,000 cubic yards of concrete for the buildings and the work; 12,000 tons of reinforcing steel furnished by Ryerson.

#### Personnel

General superintendents for Newberg are F. W. Durocher and John Hamrin. The four job superintendents are John Pearson, John Gangl, Fred Washburn, and M. Borik. For the Chicago Housing Authority, Dan Iverson is the project engineer and James S. Braxton is the senior mechanical engineer. H. "Doc" Barber is the architect's representative. The



A carpenter nails down the 1/4-inch Masonite for floor forms while, in the background, B-E cranes place concrete floors for another building.



Floor forms of 1/4-inch Masonite are supported by 2 x 4's laid flatwise with a gap of 2 1/2 inches between them. The 14-foot-long 2 x 4's are handled in groups of four. Two nailing boards keep them in place. The 2 x 4's are supported by bar joists which, in turn, are supported by Ellis adjustable shores.

## All-Euclid Fleet moves 2 million yds in one month

Twenty of these S-24 Scrapers in the all-Euclid fleet are keeping Stage 3 earthmoving well ahead of schedule... they've maintained a 95% availability record on this "round the clock" project.





## Labor Review

### Average hourly rate for union building trades estimated at \$3.83

The average hourly wage rate for union building-trades workers rose 6.4 per cent to \$3.83 an hour during the third quarter of this year, according to the Bureau of Labor Statistics' quarterly survey of seven major trades in 100 cities. The percentage increase was the same as in the corresponding quarter of 1960, BLS reports.

About one-tenth of the workers included in the survey received wage increases during the July-September period. The most common wage increase was 10 cents an hour, provided in one-fourth of the adjustments. Five-cent and 15-cent increases each occurred in a fifth.

Since October 3, 1960, the average wage increase for all trades amounted to 14.7 cents an hour, and ranged from 9.4 cents for plasterers to 18.4 cents for electricians. The average rate for all trades now is 4 per cent higher than a year ago and 85 per cent above the 1947-49 average.

### Cleveland ironworkers tie up 100 jobs over stewards' pay rift

Some 500 to 600 ironworkers remained off the job in the Cleveland, Ohio, area, tying up an estimated 100 jobs in Cuyahoga County and another 25 jobs in nine other nearby Ohio counties.

At issue was the union's demand for guaranteed pay for stewards during the life of a job, according to an employer spokesman. Iron Workers' Local 17 already has the provision in the nine other counties included in its jurisdiction. Struck contractors in Cuyahoga County re-

taliated by locking out ironworkers employed in the nine counties.

Wages were settled earlier on a 3-year, 45-cent basis between contractors and the building trades, leaving non-wage issues to be ironed out separately by affected crafts and employers. While the initial 15-cent increase went into effect in the spring, other building trades were understood to be waiting for the outcome of the ironworkers' dispute before signing agreements with the contractors. About 1,200 of the building tradesmen reportedly were affected by the strike-lockout.

### Joint Board chairman hands in resignation; says panel losing authority

Richard J. Mitchell, chairman of the National Joint Board for Settlement of Jurisdictional Disputes, chooses to resign rather than preside over a panel which he feels is losing influence and authority.

The Joint Board, which long has been recognized as a model of voluntary labor-management cooperation



to resolve mutually debilitating problems, depends for its effectiveness upon full support from all segments of the industry. This support, Mitchell believes, is being undermined by the creation of alternate appeals bodies to which both management and labor may turn in the hope of getting a better deal than they might from the Joint Board.

Mitchell's resignation has been accepted. He has agreed, however, to continue serving as chairman until January 1, 1962, while a replacement is being sought.

### Hoffa sues Meany, AFL-CIO council members, alleging slander, libel

Following through on a recently made threat, James R. Hoffa filed suit for \$1 million in damages for alleged libel and slander by AFL-CIO president George Meany and other members of the federation's executive council as an aftermath of the council's vote to provide a haven for defecting Teamster Union locals.

The suit by the Teamster president, on his behalf and that of the international union, is based on statements by Meany following the council's officially registered 26-to-2 vote rejecting a motion that the Teamsters Union be readmitted to AFL-CIO membership and the subsequent decision to offer AFL-CIO charters to Teamster locals voting to leave the ousted union.



### Bedford Const. Co. using 37 Eucs for Stage 3 of South Saskatchewan Dam

"Euc" TC-12 Crawlers and S-24 Scrapers make an ideal team for high production earthmoving on this 26 million yd. contract with a tight completion schedule. Heaped loads of 32 yds. are pushed out in 30 seconds or less... best record for a TC-12 to date is over 700 loads in a 10-hour shift.

Largest rolled earth-fill dam ever built in Canada, South Saskatchewan will be 210 ft. high with a main embankment 100 ft. long. It will require 52 million yards of excavation and is scheduled for completion late in 1965. Bedford Construction Co. of Toronto, Ont., has the contract for Stage 3 of this big project—26 million yds. to be moved by June, 1963.

In this well organized, high-speed, high production job Euclid fleet works 20 hours a day, six days a week. Bedford Construction purchased 24 Euclid Scrapers of full capacity (20 Model S-24 and 4 Model TS-24 "Scrapers"), 7 Model C-6 and 6 Model TC-12 Crawlers after a study of the productive capacity and job availability of competitive equipment... on earlier construction at this site and on other jobs.

In a recent month these "Eucs" moved 2 million bank yards of material on hauls up to 9,000 feet one way... with production of 50,000 yds. a shift. The big TC-12 crawlers push heavy loads out of the borrow pit in less than 30 seconds. This kind of production Bedford Construction expects to maintain throughout the tight schedule by six months... no wonder that Bedford Manager Vic Grant reports, "... we're confident our Euclid equipment was the right one!"



Bedford Construction is using 7 C-6 "Euc" tractors for dozing and towing compaction equipment on the fill. All-wheel drive TS-24 Scrapers—four of them—clear out muck holes and maintain haul roads... after a near cloud-burst they cleaned up impassable haul roads so that the S-24 fleet was rolling again in only 7 hours.

# EUCLID

DIVISION OF GENERAL MOTORS, HUDSON, OHIO  
Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland

For more facts, use Request Card and circle No. 258

## Foreign Projects



In England, the \$8.5 million Runcorn-Widnes Bridge rises 280 feet above the Mersey River. With a main span of 1,082 feet, this reportedly will be the largest single-arch bridge in Europe. The Joseph Gundry nets are of braided nylon that has a breaking load of 500 pounds.

Vienna's new \$10 million airport at Schwaben, just outside the city, is being built with jet travel in mind. All administration buildings and terminals are soundproofed, and buses carry passengers to and from jet planes, which land far enough away so that structures are protected from jet exhaust stream.

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**Hinged Side Plate SNATCH BLOCK**

**DESIGNED FOR QUICK OPENING**

- Acme threaded nut, less turns to tighten.
- Nut is integral part of hinged plate, for ease of stringing up. No nuts or bolts to lose.
- Drop-forged, heat-treated steel. High-speed bronze bushings, or HI-LOAD roller bearings. Alemite lubrication.

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# The Bookshelf

## Fast report ready on AASHO Road Test

**THE AASHO ROAD TEST, HISTORY AND DESCRIPTION OF PROJECT. Special Report 61A.** Published by the Highway Research Board. 58 pages. HRB, 1201 Constitution Ave. N.W., Washington 25, D. C. \$9.40.

This is the first of several reports on the latest AASHO Road Test conducted by the Highway Research Board on specially built test loops near Ottawa, Ill., during the past four years. Both portland-cement-concrete and asphaltic-concrete pavements, as well as certain types of bridges, were included in the test to determine the behavior of pavement structures under moving vehicle loads. This project was considerably larger and more comprehensive than the two previous tests, results of which were published in 1952, 1954, and 1955.

Special Report 61A is presented in three chapters. The first outlines the project, states its purposes, and suggests the applicability of the results. The second chapter describes the project site, the test facilities, and the test traffic; it also outlines the measurements, data-processing, and analysis programs. The third chapter describes

the experiment designs, layouts, and cross sections; discusses the research studies for pavements and bridges; and includes descriptions of certain associated studies conducted at the test site.

Future reports will describe materials and construction of the test road, operation of traffic, research on flexible and rigid pavement sections, research on bridges in the test, special studies, and a final summary. Engineers who want copies should write to HRB.

## Unit-operation design in sanitary engineering

**UNIT OPERATIONS OF SANITARY ENGINEERING** by Linell G. Rich. 308 pages. Published by John Wiley & Sons, Inc., 605 Park Ave. S., New York 16, N. Y. \$10.75.

This book deals with only one facet of sanitary engineering—the design of unit operations, or physical processes, which are common to many water and waste-treatment systems. It is written for those with a typical undergraduate background in civil engineering. The author is head of the department of civil engineering at Clemson College.

## Economic study published on proposed dam in India

**ECONOMICS OF A MULTIPLE-PURPOSE RIVER DAM** by N. Y. Sengupta and Nidhanthi Rathi. 339 pages. Published by Asia Publishing House, distributed by Toplinger Publishing Co., Inc., 119 W. 57th St., New York 19, N. Y. \$7.

Here is a report of a survey made by the Gokhale Institute of Politics and Economics, Poona, India, of the economic benefits of the Hirakud Dam to be built on Mahanadi River.

The book gives a description of economic conditions in the benefiting regions and estimates agricultural production after irrigation. It also discusses the possible effects of flood control and the generation of hydro-electric power. Calculations of overall benefits and costs are made on the basis of concepts and practices evolved in the United States.

## Signs and barricades for construction sites

**MANUAL OF SIGNS: Markings and Barricades for the Protection of Construction and Maintenance Operations in the Washington Metropolitan Area.** 37 pages. Free copies from Francis B. Twiss, Deputy Director, Department of Highways and Traffic, Washington, D. C.

Although this manual listing accepted means of protecting construction and maintenance sites was

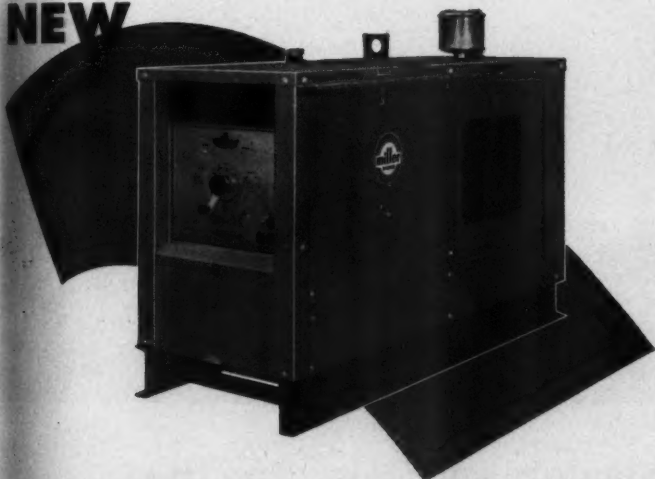
written for the Washington, D. C., area, the material is pertinent anywhere. The text is well illustrated with drawings.

The signs, markings, and barricades described conform with the standards established in the 1961 manual prepared by the National Joint Committee on Uniform Traffic Control Devices. Such devices are 24-hour sentinels that warn the public of possible danger ahead and that guard crews and work. Using sound engineering principles in the selection, installation, and operation of control and protection devices is of the highest importance to the construction industry.

Among the subjects covered are regulatory and warning signs, maintenance and minor-construction warning signs, guide signs, stanchions, barriers and channelizing devices, barricades, the manhole fence, and the use of flags and auxiliary devices such as cones, flashers, lanterns, and electric lights.

The manual governs work of all contractors and other parties involved in construction, maintenance, or any operations affecting pedestrian and vehicular traffic. It establishes the minimum standards for adequate traffic control and protection and covers the most typical situations met by contractors.

# NEW



## Miller Welder/Power Plant Reliability now available with Diesel Economy and Safety

Hercules 38 h.p. 3 cylinder direct injection diesel engine drives new Miller DD-250-L d-c welder/a-c power plant, which delivers:

- Two d-c welding ranges: 50-200 amperes, 150-350 amperes
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- Maximum open circuit voltage: 65
- Current adjustment steps: infinite
- Power: 12 KW, 115/230v single phase, 60 cycle a-c.
- Up to 6.5 KW a-c while welding, 1 KW, 115v auxiliary d-c power while welding.

Complete details and engine specifications will be sent promptly upon request.

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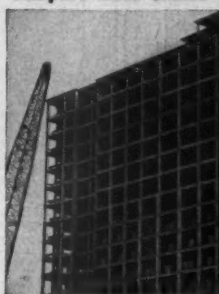
ELECTRIC MANUFACTURING CO., INC. • APPLETON, WISCONSIN

Distributed in Canada by Canadian Liquid Air Ltd. 100 Montreal

For more facts use Request Card and circle No. 261

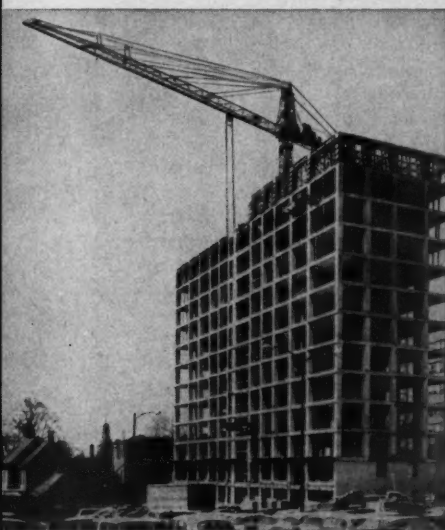
NOVEMBER, 1961

put yourself on  
the work deck—and  
compare these cranes



Above: Crane reaches upward from ground, has just limited reach into work area.

Right: Climbing crane hoists itself 2-3 floors at a time as structure is being built. No tower or ropes needed—climbs hydraulically, on floors or inside elevator shafts, to unlimited height. Jib rotates, reaches entire work area.



## CONCRETOR®-LINDEN CRANE climbs to any desired height—picks up and places loads anywhere within 200' diameter circle

If you were watching this crane at work—on the jobs it is handling right now—you'd see how dependably it is speeding contractors' progress—cutting their costs way down.

Note how this modern work-tool perches atop structure. 100 ft. jib rotates full circle. You pick up loads from any side, place them "on a dime"—out to perimeter or wherever desired. Concrete buggies? Out-moded. Deck ramps? Past history.

Send for magazine articles which describe this advancement in crane design. All electrical. Remote-controlled by one man on deck.

Recommended for apartment and office buildings, industrial structures, silos, water towers, bridges, viaducts, etc.

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## Manufacturer Memos

Edward L. Smith, chairman of the board and chief executive officer of Huber-Warco Co.



Edward L. Smith has been elected chairman of the board of directors and chief executive officer of Huber-Warco Co. He had previously served Westinghouse Electric Corp. in various executive positions.

Also elected to the board was John P. Courtright, vice president of sales of the Coal Machinery Division of the Joy Mfg. Co., and former president of the Marion Power Shovel Co.

Huber-Warco, with main offices in Marion, Ohio, makes road graders, road rollers, and related equipment.

The Parsons Co., Newton, Iowa, a division of Koehring Co., has appointed John H. Donovan, Jr., controller. He had been a budget analyst at the Koehring Division in Milwaukee.

Lull Engineering Co., Inc., St. Paul, Minn., has named John J. Derwin vice president and general sales manager. He will direct sales of high-lift loaders, heavy log and lumber equipment, road and street maintenance equipment, and sales of the company's Contract Manufacturing Division.

Baldwin - Lima - Hamilton Corp., Philadelphia, has named Henry F. Barnhart vice president in charge of sales for construction equipment. Charles M. Lippincott succeeds him as vice president and general manager of the Construction Equipment Division; he had been vice president and general manager of the firm's Austin-Western plant. Francis Cheney has been appointed manager of the B-L-H plant at Lima, Ohio, and Robert D. Bass manager of the Austin-Western plant in Aurora, Ill.

Universal Atlas Cement Division of United States Steel Corp., New York City, has announced the appointment of W. Owen Lawrence as vice president of manufacturing. He had been assistant vice president of engineering and research.

R. G. LeTourneau, Inc., Longview, Texas, has appointed E. A. Rhodenhiser its factory sales representative for the state of Georgia. He will handle the Pacemaker line of equipment for the construction and mining industries.

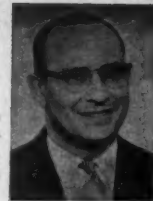
Ward B. Browning, Jr., has been named chief engineer of the Armco Division of the Armco Steel Corp., succeeding John B. Whitlock who has retired. At Middletown, Ohio, headquarters he will serve as staff adviser on engineering, construction, main-

tenance, and maintenance material activities. He will also coordinate activities among the division plant engineering staffs.

John W. Thornton has been elected vice president and general manager of the Industrial Division of Joy Mfg. Co., Pittsburgh, maker of heavy machinery for mining, construction, and general industry. He had been vice president of marketing for the firm.

Air Reduction Sales Co., New York, N. Y., has appointed W. W. Little-

William J. Weisz, near right, vice president of communications products, and Homer L. Marrs, far right, vice president of sales, Motorola Communications Division.



field manager of its new Arlington (Texas) district. He was formerly district manager at El Paso for the company.

The new district is a consolidation of two former districts covering northwest Texas, Oklahoma, New Mexico, and part of Arizona. Airco, a division of Air Reduction Co., Inc., produces and supplies industrial gases and welding products.

Two executives of Motorola's Communications Division have been elected corporation vice presidents. Homer L. Marrs has been promoted to vice president of sales, and William J. Weisz to vice president of communications products for the division. Marrs had been national sales director and Weisz manager of mobile and portable communications products.



Five of the Manitowoc cranes sinking a few of the thousands of sand cores needed for "Operation Siphon"

## How Geo. M. Brewster and Son, Inc. use 8 Manitowocs to sink thousands of sand cores

Acres of marsh land near Teaneck, N.J. were recently drained of excess ground moisture by a unique method devised by Geo. M. Brewster & Son, Inc., Bogota, N.J. The drainage job was necessary prior to the construction of a portion of the Bergen-Passaic Expressway connecting State route 17 with the George Washington Bridge.

Brewster's method of converting water-soaked meadow land to a stable road bed reportedly represents savings of as much as \$700,000 a mile. Basically, the unusual procedure consists of sinking thousands of sand cores which tend to "siphon" ground water from the area. The present strata is composed of rootmat on top, followed by peat, organic silt, crusty clay, dense glacier till, and red shale bed rock. Eight Manitowoc cranes — ranging in capacity from 80 to 125 tons — were moved in after 205,000 yds. of mushy topping had been replaced with sand fill.

The sand was needed to provide a firm footing for the giant cranes.

### Unusual Procedure

The Manitowocs were equipped with air hammers, compressors, additional rigging, and special sand skips. In forming the sand cores, 20" diameter casings of half-inch steel are driven by the hammer-mounted cranes to depths ranging from 60 to 135 ft. Casing tips have a hinged trap door, kept in a closed position by downward thrust, preventing clogging of the pipe as it is driven. When the casing reaches firm bottom, sand is forced into it under pressure of 100 P.S.I., compacting the column and forming a solid sand core. After air pressure is applied at the top of the pipe, the bottom trap door is forced open and the casing slowly withdrawn, leaving a perfectly-formed sand core.



## Management

# Practical programs for cost reduction

by GEORGE E. DEATHERAGE, P. E.  
construction consultant

The great need for men trained in construction job planning is pinpointed in the latest report of the Education Committee of The Associated General Contractors of Amer-

ica. Asked what specific subjects should be included in a proposed construction engineering course, more than 1,000 contractors agreed on the following, listed in the order of

their preference:

1. Construction estimates and costs
2. Construction job planning
3. Contracts and specifications
4. Construction materials
5. Soil mechanics, earthwork, and foundations
6. Site layout and development
7. Formwork design
8. Engineering evaluation (appraisal, depreciation, insurance, taxes, etc.)

I would put job planning first, since the estimator must visualize how the work is to be done before he can price it. Too many builders start work without planning, which is not the way to underbid competitors and to reduce costs.

A practical program for cost reduction means exploring alternate

methods of performing work. Actually, very little engineering schooling is required as a background to the subjects listed here, and any competent estimator can familiarize himself with modern planning methods by reading any of the many recognized works on industrial engineering.

The important thing for contractors to realize is that in the simple application of methods engineering lies their greatest opportunity for cost reduction. Applied to home building, R. J. Johnson, director of research and technology of the National Association of Home Builders, states that methods engineering "will bring about another metamorphosis in the house building business . . . and be the 'make or break' factor for a lot of builders." What can be done in the house-building industry has already been accomplished by some large industrial concerns doing their own building.

### The cost system

In job planning, the estimator must have a sound and practical cost system to follow. Incredibly, only about 30 per cent of contractors maintain a complete cost system. The lack of such a system is so general that a reason must be found other than "expense" or "specialized knowledge." Perhaps it can be attributed to "contractor psychology." The fact is that with the proper procedures, a cost system is neither intricate or expensive. It is, however, demanding and keeps an organization on its toes.

If costs are running out of line, one must first know where and why. Cost keeping starts with the estimator. Using a predetermined cost code, he must take off his quantities and post his estimate sheet in compliance with it. This means that work classifications must always be set down in the same order and the units must contain the same elements that are contained in the field labor units as reflected on the payroll. That is, units must not be contaminated with overhead items or equipment expense unless the field units also contain them.

Contrary to popular notions, this does not add to expense. In fact, orderly, systematic procedure saves time and reduces the chances of error. If a job being bid is secured, the cost man or clerk has a complete listing of all items of work, properly coded, so that a direct comparison can be made between estimated costs and actual costs.

A simple cost system is presented in the new AGC publication, "A Suggested Guide for Field Cost Accounting for Buildings." If you want to adapt the procedure to work in other classifications, such as highways, or heavy engineering construction where equipment instead of labor is the major factor, all you have to do is give the machines "badge numbers" and carry these on the foreman's report at the hourly ownership/operating rate. There is no added expense here, since the foreman has to make out his time report, stating the hours worked and on what jobs. The only added work is that the clerk or

(Continued on page 36)

in the manner of a wick, the core attracts water and "siphons" it to the surface. To this siphoning action, a second blanket of sand is laid over the entire area. Pressure, created by the weight of the sand blanket, forces below-level water out and follow the sand cores to the surface. The runoff is carried by a network of drain pipes to nearby meadows.

### Manitowocs Fit Job Best

Ken M. Sterling, Superintendent in charge of Brewster operation, said, "No other crane could do this type work as well and fast as Manitowoc." Because of the unstable ground condition found at the job-site, the outstanding stability of the Manitowoc cranes was an important factor. Every Manitowoc has an extremely low center of gravity, the counterweight placed low and far back. The heavy, single-weldment car bodies also contribute to overall stability — are mounted directly on crawler frames for rigid, unitized construction.

Low ground bearing pressures, resulting from long, widespread crawlers, were important in traveling over the marshy ground. Without "floatation" provided, the large cranes would have sunk themselves in and mired down in the soft ground beneath their treads.

Manitowoc's clean design and extra strength of components enabled the Brewster company to mount many heavy, bulky special attachments. Cranes carried 11 to 14 tons of compressors, in addition to sand skips and extra rigging and leads.

Leading contractors such as Geo. M. Brewster & Co., Inc. tackle a demanding job like this one, rely on Manitowoc shovels and cranes to do a job, with less downtime and maintenance. The same advantages that make Manitowocs first choice for the specialized jobs, can help you make a profit on conventional jobs, too. Ask your distributor for literature on the Manitowoc that fits your work schedule best. There's a wide range — from 1 1/4 yd. to 7 yds., and 25 tons to 125 tons.

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a subsidiary of The Manitowoc Company, Inc.)  
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**Manitowoc**

The most *USEFUL* line of  
Standard and Custom-designed machines

CRANES  
25-125 TONS

TRUCK CRANES  
45 and 60 TONS

SHOVELS  
1 1/4-6 YDS.

DRAGLINES  
1 1/4-7 YDS.

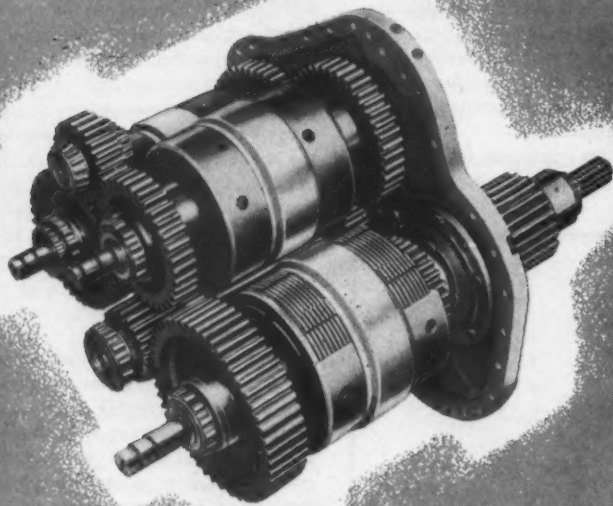
TRENCH HOES  
1 1/4-3 YDS.

For more facts use Request Card and circle No. 263

MEMBER, 1961

23

# this new power-shift transmission



**NOW YOU CAN CHOOSE** your LeTourneau-Westinghouse B Tournapull® with either Fuller step-gear transmission (with LW High and Low Range) . . . or all-new LW-designed-and-built POWERFLOW 700 transmission. It's a constant-mesh, countershaft-type unit with full power-shift and torque converter . . . extremely simple, reliable, proven in over two years of testing.

## No "shift-shock"

Because double-acting clutches in the "700" cannot engage simultaneously, you'll never have gear "overlap" or "underlap", therefore never be troubled with "shift-shock". Wet-disc range clutches engage hydraulically by means of manually-operated rotary valves.

## Cooler running

Pressurized "mist"-type lubrication reduces amount of oil within the case, therefore minimizes heat-load common to splash or cover lubrication. All transmission oil is filtered and cooled, with throw-away filters.

## 8:1 ratio and QUIET

The 8:1 ratio spread of the "700" is the widest in the industry. You will find it exceptionally quiet, too, because ground spur gears, mounted next to bearings on large-diameter shafts, are used throughout.

## Rear-mounted for accessibility

You won't often have to work on this transmission, but when you do, you will find it easy. It's rear-mounted, for fast, "walk-up" accessibility and removal.

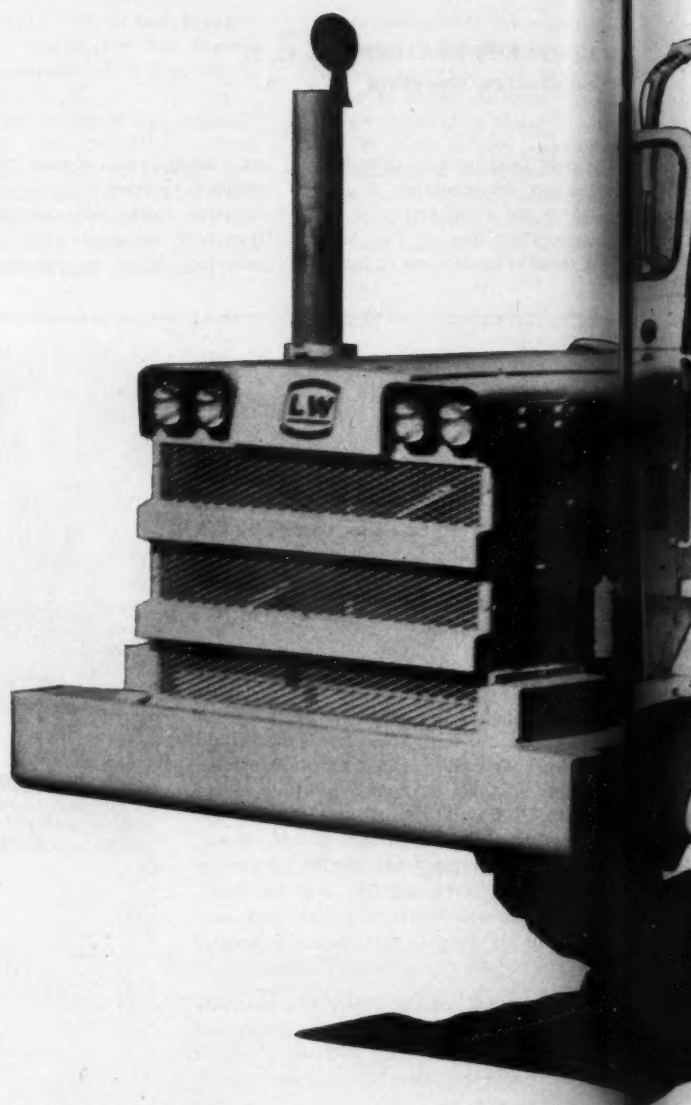
## Automatic lock-up

For dollar-saving "straight-drive" operation at higher speeds, the "700" features automatic lock-up. An extra: the lock-up clutch also engages automatically when hydraulic brake is applied, so that engine braking power is added to that of the hydraulic brake.

## Gear-coupled torque converter

For easy installation and removal, the "B's" torque converter is gear-coupled. It offers integral sump design, plus Full-Flow filtration of all converter fluid. It has a stationary stator, to eliminate "over-riding clutch".

# NOW OFFERED



## ...plus these other

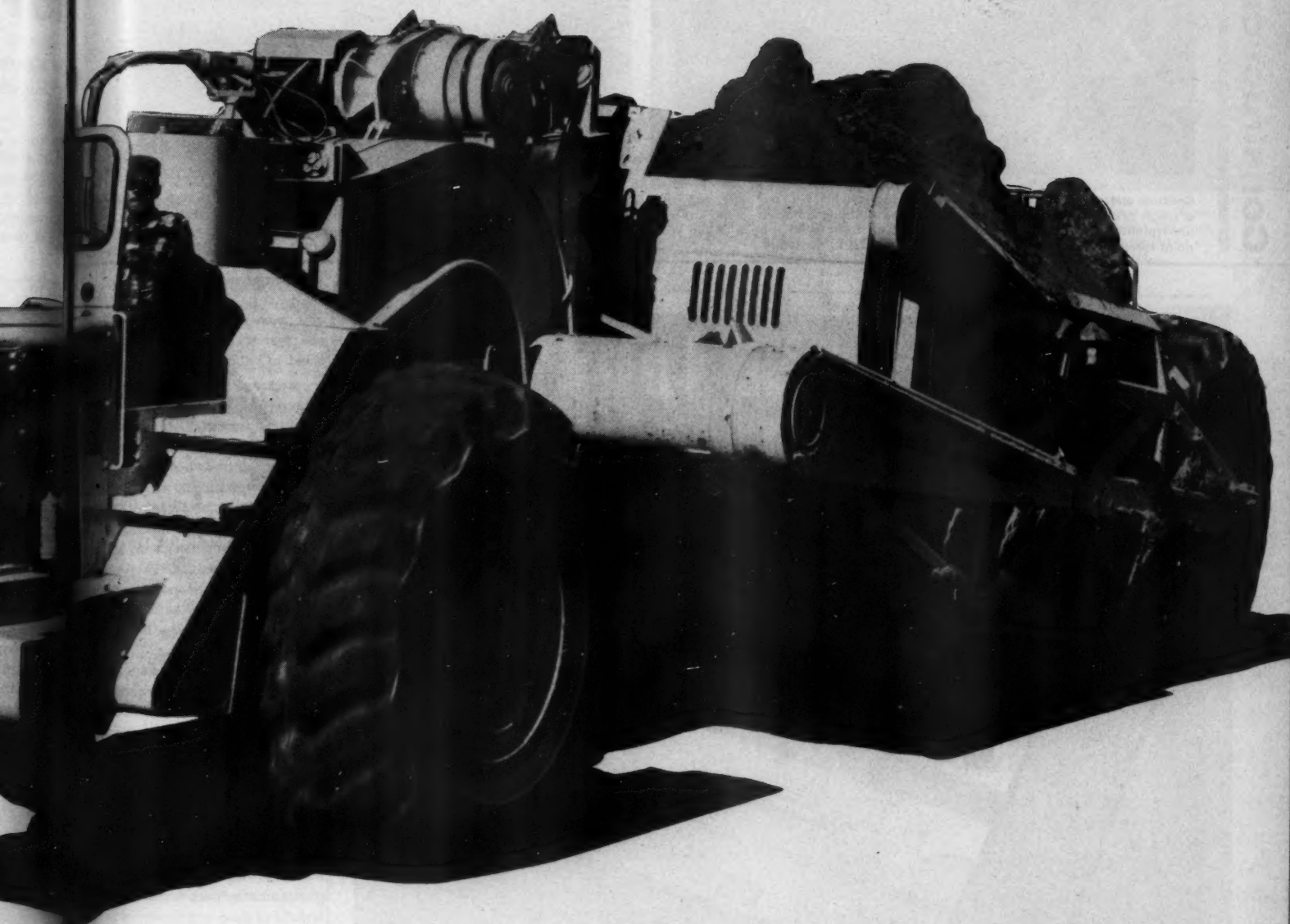
*6,000 lbs more payload capacity;  
5,000 lbs less "deadweight"*

Capacity of the "B" is now 25 cu yd struck, 32 cu yds heaped, and 37 tons. That's 3 tons more than previous models. Yet, because the yoke, apron, and structural members of the Fullpak® scraper are now made of lightweight high-tensile-strength steel, the "B" weighs almost 5,000 lbs less than before! With its GM 12V-71 diesel producing 430 hp at 2100 rpm, you enjoy the snap and power of the *best* power/weight ratio of any scraper of this type and size.

Your LW Distributor has the complete story of these B 'Pull improvements. He can show you how they can work for you . . . for lowest-net-cost-per-yard. See him now.



# D IN TODAY'S BIG YARDAGE B 'PULL'



## new production-boosters:

### *Dry type air cleaners*

Most effective air induction system available! Two-stage filtration provides long element life, and first-stage element *cleans itself*.

### *Single-motor control of apron, bowl-hoist*

One motor and a new cable-control unit now operate both your apron and bowl-hoist. This reduces generator loads, reduces service and parts requirements.

### *Feather-touch lever controls*

Your operator now controls scraper work-motions with three "fast-grasp" knobbed levers that move forward and back swiftly, with "feather touch" instant "feel-of-load" response.

You will find many *more* improvements in the B Tournapull. A new tailgate design that speeds loading. New "straight-up" scraper side-sheets that make it impossible for rocks to lodge between sides and scraper arms. New safety latches with automatic "cut out". More than a dozen "maintenance speeders".

\*Trademark BP-2486-DC-2



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A Subsidiary of Westinghouse Air Brake Company

*Where quality is a habit*

For more facts use Request Card and circle No. 265



Concrete operations for two new buildings in Jacksonville, Fla., get under way after a tough preliminary problem was solved. The building adjacent to the site was underpinned, and 14 feet of water was removed from under it by a Griffin Well-point system without getting any closer than 25 feet to the walls.



A steel section for a 162-inch-diameter, 1,030-foot-long Armco Multi-Plate culvert near Interstate 90 near Willoughby, Ohio, is positioned by a Bucyrus-Erie crawler crane. The section is bolted together by impact wrenches, powered by a LeROI Tractair. A B-E truck dozer pulling a vibratory roller prepares the trench.



## aerotron slimline fm power package

**FACT:** The Slimline is the only 100-watt VHF Mobile Radio on the market. **PURPOSE:** Greater range from car to car—from car to base station... full saturation coverage of your entire area without dead spots. The Slimline power package (VHF or low band) is the only system that offers instant selection of normal output for short distance calls and full 100-watt output for long distance calls. **ADVANTAGE:** Keeps battery drain low. The stand-by power switch further reduces battery drain to less than that required for parking lights.

AERONAUTICAL ELECTRONICS, INC.  
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**AEROTRON**

For more facts use Request Card and circle No. 266

**IMPORTANT FEATURES:** Transistor-powered / Heavy-gauge aluminum construction / Weight: Under-dash unit—8 lbs. 10 oz.; amplifier—13 lbs. 2 oz. / Precision hand-wired circuitry / Boost any 10-30 watt equipment to 100-watt output with amplifier alone. **OPTIONAL:** 2 or 3 channel operation / Unicall to guard against transmission from stations sharing the same frequency. **PRICE:** including all standard accessories: VHF—\$595; low-band—\$615; amplifier only—\$250. For complete information, write today. (VHF: 148-174 MC)

(Continued from page 23)

cost man must distribute the field charges on the labor distribution sheet in balance with the payroll.

### To measure work done

Any contractor with an interest in his job will have some means of checking up periodically on what his men are accomplishing. By whatever means he does this, it takes time and effort. If he uses a cost system, the checking is done weekly as a matter of regular procedure. This is a fine opportunity for the estimator to pick up some valuable data. Or checking can be done by the foreman, engineer, or timekeeper.

Many contractors who do not have a regular cost system use spot checks. This saves no money and keeps the contractor and his crew in a constant state of uncertainty. When a foreman or supervisor knows that the output of his crew is being regularly checked, for whatever reason, it is just human nature for him to try to boost output. He will probably get at least 5 to 10 per cent more out of his men and machines under a cost system.

### Field planning

Work-simplification process charts to set up the best method of performing specific tasks on the job are an important part of cost reduction. These are doubly productive if the prebid charts are used as a check and a guide.

Because the use of gang process charts seldom involves engineering or the use of higher mathematics, every supervisor down to the foreman level can learn the method in a day or two. The small contractor, as well as the large one, can use this technique and save from 10 to 15 per cent in production costs.

### Employee training

It seems that employee training will never have the recognition it deserves in the construction industry until construction management is looked upon as an art and a science as is industrial management. Perhaps there should be a degree in construction management, which might follow a study program along these lines:

Construction organization; plant

CONTRACTORS AND ENGINEERS



culvert under  
over crane, B  
B-E truck cr

FOR ALL MINNEAPOLIS STREETS is produced at its municipal plant, where the Mani-  
crane operator handles a quarter of a million tons of material during an 8-month  
period. The plant can process every grade of material that is required by the city—from  
wearing-course asphalt.

grow; and equipment; planning and  
controls; estimates and costs; cost  
accounting, systems, and procedures;  
construction processes; tools, jigs,  
and fixtures; equipment economics;  
materials and material handling;  
equipment maintenance and repair;  
scheduling and graphic analysis; proc-  
essing charts; work measurement and  
time study; motion and methods  
study; work simplification; wage  
plans and controls; purchasing,  
scheduling, and expediting; inspec-  
tion; safety and fire protection,  
liability, insurance, and taxes; statisti-  
cal methods; and research and de-  
velopment.

This list of subjects is not much  
different from that required in an  
industrial-plant management course.  
Actually both are manufacturing and  
assembly processes that differ only in  
functional detail.

The diversity of this proposed sub-  
ject matter is indicative of the dif-  
ficulties involved in attempting to add  
such courses to an engineering cur-  
riculum. The educational process is  
slow, and any progress will be some  
time in arriving. Until that time  
comes, construction management will  
be difficultly reaching a peak of ef-  
ficiency equivalent to that in the  
manufacturing and process indus-  
tries.

THE END

### Engineers, designers win Lincoln welding awards

Awards totaling \$25,000 for papers  
on progress in arc-welded design of  
structures and machines have been  
presented to 105 engineers and de-  
signers by The James F. Lincoln Arc  
Welding Foundation, Cleveland, Ohio.  
In the Structures Division the first  
prize of \$3,000 went to K. E. Dum-  
mald and D. C. Hoffman, both design  
engineers in the Bureau of Bridges  
Division of the Ohio State Highway  
Department, for "Redesign of a  
Bridge Superstructure."

Second prize of \$1,500 was given to  
John F. Orsborn, University of Wis-  
consin, for his paper, "The Renal-  
sance of Steel Dams."

The \$1,000 third award was given to  
Peter P. Petkoff and Lin Y. Huang,  
engineers of Minoru Yamasaki-  
Smith, Hinchman & Grylls, Detroit.  
Their paper was titled "Welded Sky-  
scraper."

ENGINEER  
DECEMBER, 1961

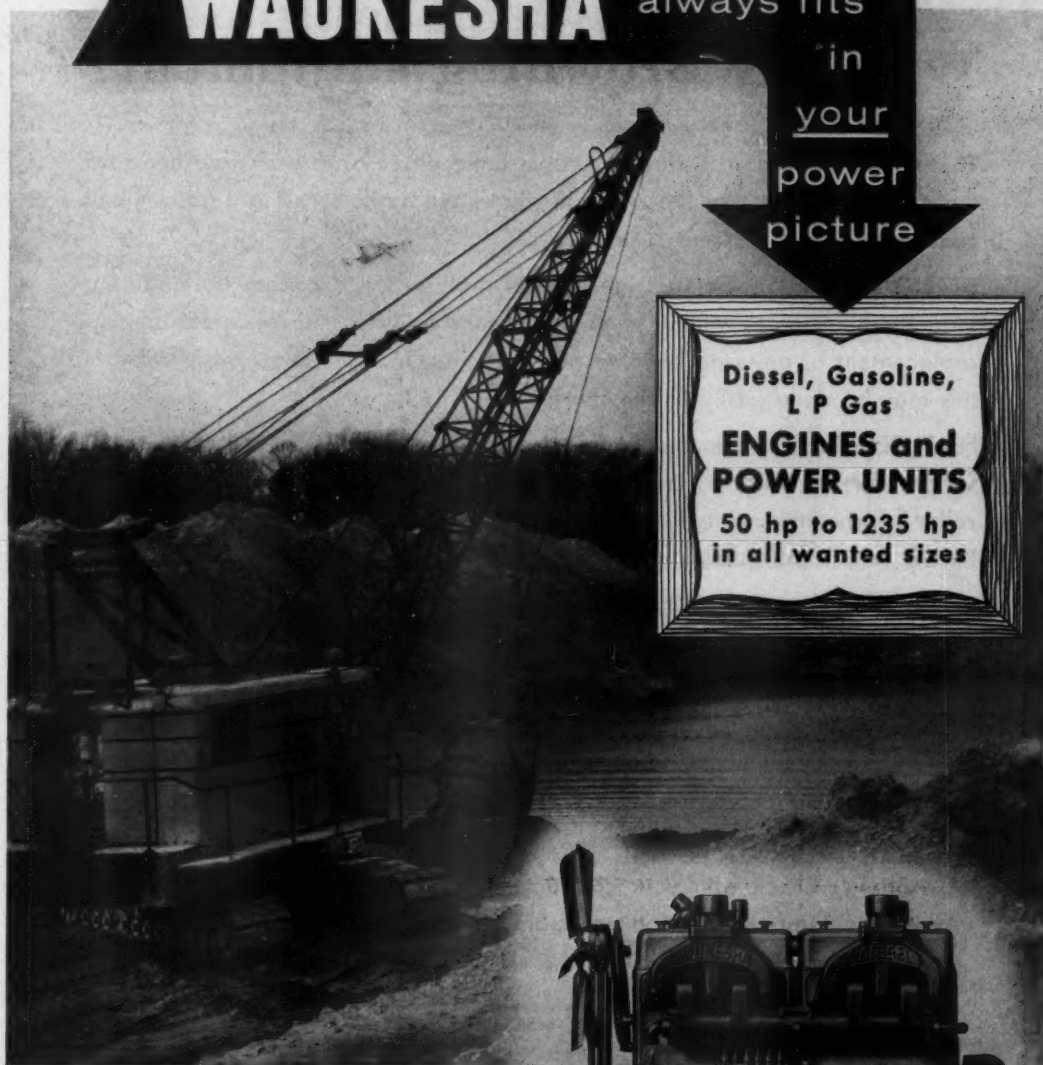


EQUIPPED WITH CLAMSHELL BUCKET, a Hanson truck crane excavates for a new drain-  
age structure along one of the access roads at the U. S. Air Force Academy, Colorado  
Springs, Colo. This is an operation conducted by maintenance-service personnel at the  
school. The Academy has been located at this new site for the past three years.

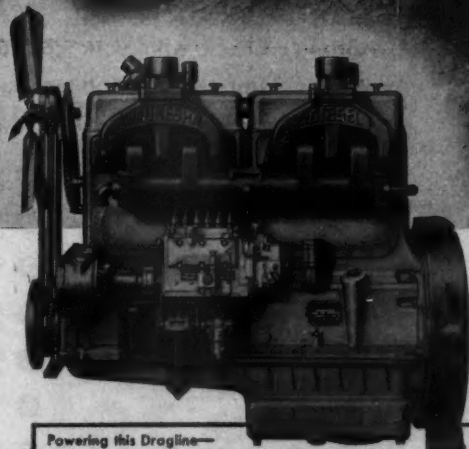
# WAUKESHA

always fits  
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power  
picture

Diesel, Gasoline,  
L P Gas  
**ENGINES and  
POWER UNITS**  
50 hp to 1235 hp  
in all wanted sizes



Demolishing or dumping, excavating or erecting,  
pouring or pumping, lifting or loading—whatever  
equipment the contractor needs to do the job—  
there's a Waukesha Engine to power it depend-  
ably! Easy to start, speedy, smooth, with extra  
power in the pinches—Waukeshas are economical  
to run and keep up. Your Waukesha Distributor  
knows your power needs.



Powering this Dragline—  
WAUKESHA Industrial Model WAKD Diesel  
6-cyl., 6 1/4 x 6 1/2-in., 1197 cu. in., up to 258 hp. Get Bulletin 1415

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN / New York • Tulsa • Huntington Park, Calif.

Factories: Waukesha, Wis.; Clinton, Iowa; Houston, Texas

For more facts use Request Card and circle No. 267

490-R



A breakthrough in one of the world's oldest construction practices—

## New sonic pile driver

An engine and a system of vibrating hammers that deliver 400 horsepower energy to the pile ride along the leads as the pile is driven. In the demonstration, one man on the platform controlled the driver, one man kept in contact with the operator from the ground, two helped position the pile on the ground, and another man operated the crane. A special clamp held the pile to the machine to insure efficient transmission of energy to the piles.

### Why buy Browning equipment? Why buy Browning equipment? Why buy Browning equipment?

That's a fair question! Different people have different reasons, but here are the answers to some of the questions that have made sense to a good many contractors — our present customers.

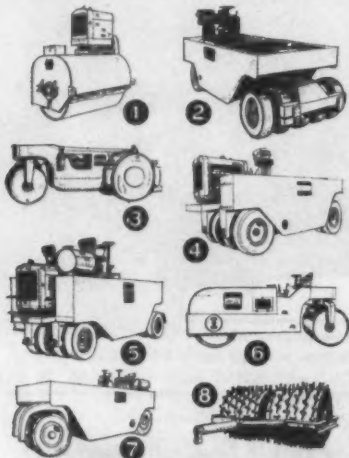
**DEPENDABILITY:** Flawless design, quality materials and expert workmanship virtually eliminate downtime, even under constantly rugged conditions. Should replacement of any part become necessary, each roller is so designed that this may be done easily, in the shortest possible time.

**FEATURES:** Each unit in the BMCO line is specifically designed to do its job with maximum economy, efficiency and ease of operation. No other make of roller incorporates as many new, exclusive and proven features as does BMCO. BMCO rollers are geared to your needs . . . and your pocketbook.

**PRICE:** The price of BMCO rollers is the result of superior materials, construction and workmanship — less of your dollar goes into overhead — more of it goes directly into the unit than in any other roller you can buy.

**CONVENIENCE:** Browning manufactures the most complete line of dependable compaction equipment available anywhere. Its nationwide network of distributors assures prompt service and delivery regardless of your location or contract site.

**RELIABILITY:** Check with your contractor friends, your BMCO distributor—or any of our competitors! You get more with BMCO.



- 1 Model V-40 Vibrating Roller
- 2 Model SPB-9 Self-Propelled Roller
- 3 Steel Wheel Rollers
- 4 Model 25T11 Self-Propelled Roller
- 5 Model 18T9 Self-Propelled Roller
- 6 Tandem Rollers
- 7 Model 23T7 Self-Propelled Roller
- 8 Sheep's Foot Rollers



**BROWNING MFG. COMPANY**  
P. O. BOX 2707 - SAN ANTONIO, TEXAS  
WALnut 3-4331  
Export Office: P. O. Box 1051, Denver, Colorado

A new and radically different type of pile driver, developed and successfully demonstrated by the C. L. Gould Construction Co., Inc., of Providence, R. I., has been driving piles an average of 20 times faster than conventional driving machinery. The sonic driver, which applies the principle of sonic vibrations traveling through an elastic medium, operates with virtually no noise or vibration effects.

#### Driving time: 1 minute

At a demonstration in East Providence, the Gould Construction Co. operated the sonic pile driver and a conventional pile driver side by side on the company's property along the Seekonk River. The sonic driver drove and extracted a 75-foot, 13½-inch cylindrical steel pile with a flat end while the conventional driver with a No. 1 hammer was pounding a similar pile at the rate of 57 blows per foot to 20 to 24 feet deep and 93 blows per foot at 25 feet deep. Driving times for the sonic hammer were in the order of one to two minutes, and in some cases the time of driving was less than one minute.

#### Pile in resonance

The driving mechanism for the new pile driver consists of a special vibrating hammer system and a variable speed engine to drive the system. The engine and hammers are built onto a platform that sits on the pile and rides along the pile leads. The machine was operated by a man on the platform.

The vibrating hammers working at frequencies between 100 and 150 cycles per second efficiently transmit energy to the piles. To set the piles in resonance, the engine speed is increased until the frequency imparted by the hammer system matches or is in resonance with the natural frequency of the pile being driven. As soon as resonance is achieved, the pile begins to sink under its own weight and the weight of the driving mechanism. The engine, running at 2,800 to 2,900 rpm, transmits 400 horsepower to the hammer system. The engine operation accounts for the minimum amount of noise associated with this method of driving. There is more noise associated with the operation of the crane holding the leads than with the driving mechanism.



based on an invention of Albert G. Bodine, Jr., of Van Nuys, Calif., the driver is essentially a method of transmitting high power to the pile at high efficiency. The vibrating hammer system sets up longitudinal sound-wave vibrations in the pile, the hammers, operating in resonance with the natural frequency of the pile, reinforce the waves as they tend to diminish from dampening effects in the soil around the pile.

#### Two effects

The driving occurs from two effects of the sonic waves. The energy is transmitted as a sharp blow to the top and bottom of the pile, displacing the earth very slightly. On the return cycle of the wave the elastic energy contracts slightly, and the pile goes up the hole and sinks a small amount per wave cycle. After frequencies of 100 to 150 cycles per second the pile moves steadily down into the hole. The effect of the minute expansion and contraction of the soil around the pile do not seem to seriously affect the bearing capacity of the pile.

Extraction of the pile is done by vibrating the pile the same as in driving and then lifting steadily with the cable from the crane.

#### No ground vibration

No ground vibrations are felt with the sonic pile-driving technique. This makes the device very desirable when pile driving is done in the vicinity of a building or other structure. Nearby piles are not subject to uplift as they are with conventional pile-driving methods.

Almost any type of pile can be driven by the sonic driver as long as the material transmits vibrations and as long as there are no discontinuities along the length of the pile. Welded joints would not represent a discontinuity if welding is carefully done. The device can drive pipe piles, H-piles, sheet piles, cast-in-place piles, shells, precast piles, and timber piles. It may also be used for taking soil and other core samples.

Driving can be done in all types of

A new sonic pile driver, here demonstrated by C. L. Guild Construction Co., Inc., in East Providence, R. I., sinks and extracts a 12 3/4-inch steel shell several feet while a conventional driver with a 1 hammer works at a rate of 50 to 60 blows per foot.

soils including frozen soils and permafrost. It is not necessary to supply additional heat for the frozen materials as sufficient heat is supplied by the impact of the pile in contact with the ground. Hard objects such as wood, concrete, or boulders are either penetrated, broken, or displaced during the driving of the piles. Ledge rock may also be penetrated as desired by continually bearing the vibrating pile on the rock.

World rights for the invention are held by the C. L. Guild Construction Co. The new driver was developed

over a 2-year period of research and engineering under the direction of Charles L. Guild, president of the company. Over half a million dollars was spent in the development of the Bodine Sonic Pile Driver, and a million dollars from the Boston Capital Corp. has been secured to implement the manufacture and distribution of the product. The Boston Capital Corp. is one of the nation's largest SBIC's (Small Business Investment Companies) and is licensed under the Small Business Investment Act of 1958.

A method of calibration has not

yet been perfected for estimating the bearing capacity of the pile by observation of the driving characteristics, such as the blows-per-foot rules used in traditional pile-driving operations. Guild, however, expects to have a satisfactory calibration method developed by the time the driver is in extensive use.

Another vibrating hammer has been in use in Russia for several years, but it worked on the principle of forced vibrations, not that of natural frequencies as is used in the sonic pile driver.

THE END

## Twin-engine rigs can't beat Payscraper yardage!



"Hauling to a fill up a 5% grade, the International 295 Payscraper travels and dumps as fast as our twin-engine scrapers—matches their yardage, too!"

R. H. Godwin, Sup't  
C. C. Mangum, Inc.  
Raleigh, N. C.

"Production of our 495 Payscraper is equal to the twin-engine units running in the same cycle. The 495 is an ideal long-haul rig!"

W. W. Gibson, V. P.  
Gibson Construction Co.  
Donalsonville, Ga.



**Two separate earthmoving jobs**, involving big yardage and long hauls, recently compared dirt-on-fill production of big-capacity scrapers. Results were startling. On one job, a 2-axle International 295 Payscraper matched a comparable-size twin-engine rig yard for yard. On the other job, production figures told the contractor he equalled twin-engine scraper production with his less expensive 3-axle International 495 Payscraper—and at a much lower operating cost!

**Power is put to better use** in the Payscraper to give you a quick-loading, fast-hauling, clean-dumping rig. In the cut, large planet gears in the final drive handle full torque loads imposed by the turbocharged 375-hp diesel engine, while the 7-speed power shift transmission adjusts torque and load to speed, gets you out fast. On the haul road, positive power control of all operations, with speeds to 33 mph, permits full performance with heaped loads. Exclusive rack-and-pinion design and forward spindle pitch turns the 295 Payscraper safely, with automotive ease. At the dumping site, the big 94-in.

apron opening and two ejector plate push members assure positive ejection of the whole 34-yd. load. Positive, pto-driven cable control unit is finger tip controlled.

**Compare loading, roading and dumping cycles** with any other rig, and you'll see how Payscraper efficiency increases earthmoving profits. Call your International Construction Equipment Distributor today and let him show you what the 2-axle 295 or the 3-axle 495 can do on your job!



**International  
Construction  
Equipment**

International Harvester Co.,  
180 North Michigan Ave., Chicago 1, Illinois  
A COMPLETE POWER PACKAGE

For more facts use Request Card and circle No. 269



**Edward Schechter**  
Stressteel Corp., Wilkes-Barre, Pa.

**Designers and producers  
exchange ideas, experiences;  
fire resistance is hot subject  
at annual convention**

## PCI featurew

The free exchange not only of ideas but also of the practical details of design and production was the seventh annual convention of the Prestressed Concrete Institute in Denver. More than 800 delegates from the United States and Canada as well as from Mexico, Japan, and Germany attended.

The liberal exchange of ideas and data, almost unique in the construction industry, was a feature of the convention.



**Alfred A. Yee**  
Structural engineer, Honolulu



**Felix Kulka**  
T. Y. Lin & Associates, San Francisco



**Steven Galezewski**  
Rockwell Engineers, Los Angeles

# Planet-Drive "25" advantages add up fast—"feeding" 400-ton per-hour aggregate plants



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# new techniques

not only of the industry, is steadily adding to the production of the growing young pre-stressed-concrete industry. It brings to reality the day when the use of these ideas and techniques will become the standardized practices of the industry.

Elaborating on the convention theme, "New Opportunities in Structural Design," speakers at one of the technical sessions described some of

the most unusual and interesting structures currently being designed and built throughout the world. At other sessions, they probed more deeply into such subjects as connection details and research.

Concurrently, the producers' sessions studied the details of present practices in such fields as production techniques, estimating, sales, and relationships with architects and en-

gineers. The panel at the latter session included architects, consulting engineers, highway engineers, and representatives of the Bureau of Reclamation and the Bureau of Public Roads, as well as producers of prestressed-concrete products.

Throughout the sessions, meetings were frequently opened to questions from the audience. These questions often related to the precise tech-

The new president of the Prestressed Concrete Institute: R. J. Lyman, chief engineer of Atlas Structural Concrete, Inc., El Paso, Texas.



niques developed by the designer or producer to meet certain conditions. The willingness with which the speakers responded to these questions indicated that they placed the good of the industry above any immediate personal advantage.

Many of the delegates indicated an interest in attending the Fourth World Conference on Prestressed Concrete, which is to be held in Rome, Italy, in May, 1962. Two group tours are being planned to include visits to other European countries as well as attendance at the conference.

## Officers elected

Officers for the coming year, elected at the PCI convention, are: president, R. J. Lyman, chief engineer, Atlas Structural Concrete, Inc., El Paso, Texas; vice president, Robert A. Matthews, Precast Industries, Inc., Kalamazoo, Mich.; and secretary-treasurer, Elmer Clark, United Materials, Inc., Phoenix, Ariz.

Newly elected directors are Albert L. Grubb, Maryland State Roads Commission; George C. Hanson, Sallada & Hanson, Denver; James H. Gilbert, C. W. Blakeslee & Sons, New Haven, Conn.; and Howard Worthington, Eastern Prestressed Concrete Corp., Line Lexington, Pa.

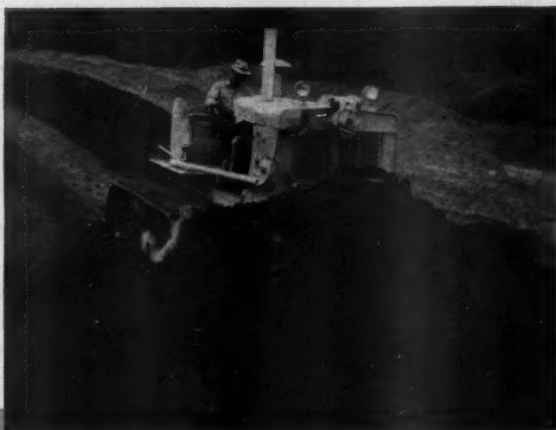
Directors re-elected at the meeting are Robert H. Singer, Ben C. Gerwick, Inc., San Francisco; Harold R. Hutchens, Carter-Waters Corp., Kansas City, Mo.; W. C. Givens, Capitol Prestress Co., Jacksonville, Fla.; and Edward Schechter, Stressteel Corp., Wilkes-Barre, Pa.

## Fire resistance is hot subject

Realizing that data on the fire resistance of prestressed members is of vital importance to the industry, PCI has had an active committee working on this subject in conjunction with fire underwriting agencies. The philosophy of fire testing and the techniques and results of some of the tests were explained at one of the conference sessions. The principal speakers at this session were Jack Bono, Underwriters' Laboratories, Chicago; Richard G. Germain, National Board of Fire Underwriters, New York City; and A. H. Gustafarro, Portland Cement Association, Chicago.

Following Gustafarro's paper, the meeting was opened to questions. A

"400 tons of pit run gravel pushed into the conveyor daily—sometimes on pushes of 200—300 feet—is great production, and we are happy," states Ken Blatner, for D. H. Blatner & Sons, Albany, Minnesota. "The big TD-25 dozer gets its load faster, carries it along without wasting its power in steering—and it completes cycles faster and easier than we believed possible."



You see first-hand what happens when crawler "half-stopping" and load-dropping are eliminated—the first time you watch an International TD-25 round a curve under full load. You don't brake a track and half-kill your power to steer. "Dead-track drag" is eliminated—"live track" Planet Power-steering gives full-power momentum, full time.

Bank-cutting bladesful of gravel without nosing into the bank or sluing is another yardage-adding dividend of Planet Power steering. You equalize offset loading, keep full hp producing, with ease. Simply power-shift the "25's" load-side track to high speed range—leave the other track in low range—and take full bites where clutch-steered dig only "nibble."

The Planet Power steering to power-shift up on-the-go (wherever possible) or—power-shift down (wherever necessary)—to get maximum speed on every push. And you do it with a standard equipment feature. Hi-Lo power-shifting is another built-in bonus of the TD-25's planetary system!

With exclusive International DT-817 engine wallop, the "25" slugs along, 230 Turbocharged hp strong—without "slow-motion" lug-downs, even at high altitudes. No wonder single TD-25's, time and again, are feeding 400-ton-per-hr. aggregate plants!

See how fast Planet-Drive "25" advantages add up—in producing aggregates at minimum cost—as well as on heaviest bulldozing or push-loading. Prove what it means in production and profit to get TD-25 four-speed torque-converter efficiency range control. Let your International Construction Equipment Distributor demonstrate!



## International Construction Equipment

International Harvester Co.,  
180 North Michigan Ave., Chicago 1, Ill.  
A COMPLETE POWER PACKAGE

Because the TD-25 can side-cut gravel without time waste and has "live track" steering to deliver full loads to the crusher, this plant is in the 400-ton-per-hour class. The job, W. Hodgman & Sons, Inc., Fairmont, Minnesota, producing gravel for an experimental stretch of soil cement base state road.

With blade built-up to six feet high, the TD-25 (at 7,800 ft. altitude) drifts huge loads of gravel into the batch plant—mainline production of 410 tons per hour with ease. Fast TD-25 reversing up the steepest grades speeds the shuttle-cycle, increases capacity. Owner: Northwestern Engineering Co., Denver, Colorado—working on an Interstate road contract east of Evanston, Wyoming.



For more facts, use Request Card and circle No. 270



Muirs Brothers Construction Co., Verona, Virginia

### Ganging Symons Steel-Ply Forms Saves Weeks of Work

With only eight months to build the piers and sub-structures for nine twin highway bridges, this contractor relied 100% on Symons Steel-Ply Forms. Assembly, stripping, movement and set-up—all were handled by crane. Concrete was poured at the rate of about 3 lineal feet an hour with each pier and sub-structure poured in a continuous operation. Symons Steel-Ply Forms are rented with purchase option. Symons Clamp & Mfg. Co., 4251 Diversey Avenue, Dept. M-1, Chicago 39, Illinois.

For more facts use Request Card and circle No. 271

Richmond Screw Anchor effectively displays its products for prestressed-concrete production. Ernest E. Trolia answers all questions for his company.



(Continued from preceding page)

member of the audience, Joseph Fitzgerald of the City of Chicago Building Department, took advantage of the opportunity to bring to the floor a long-standing argument between his department on one side and PCI and PCA on the other. The ensuing discussion was certainly one of the liveliest if not the most informative of the entire meeting. The applause indicated that most of the audience approved Gustafsson's side of the argument, as well as his handling of the hot question.

#### Connection details

Although he kept his audience in laughter most of the time, Alfred Yee, Honolulu structural engineer, presented some unique and highly practical suggestions on connection details and composite structures. His opening remarks described the Hawaiian people as so generous that they may supply you with a present member from a few inches to a foot too long "at no extra cost." With this background, he described a number of connection details that are readily adaptable to at least minor dimensional variation.

Others who presented papers at the session on connections were Harold W. Birkeland, Anderson, Birkeland & Anderson, Tacoma, Wash.; Felix Kulka, T. Y. Lin & Associates, San Francisco; Irwin J. Speyer, Freymuth Co., New York City; and Dr. Harold B. Cooke, Jr., Jones-Dabney Co., Louisville, Ky.

The design and construction of the



**UNIT**  
**MODEL 617**  
**"a real money-**  
**making rig..."**

"... fast and easy to run. It's stable and doesn't bounce around even on jobs like this where we've pounded through most of this rock without resorting to blasting." That's what S. E. Light—a "shovel runner" since 1932—has to say about this  $\frac{3}{4}$ -Yd. Model 617 UNIT trencher. Owned by R. R. Blakeman, Los Angeles, the UNIT is digging ditch up to 8' deep and 36" wide for a new storm drain. Tough digging conditions were taken in stride—hard adobe mixed with rock.

UNITs are fast because a unique *direct-in-line drive* provides power where it's wanted and when it's needed. Engine power is transmitted to the main machinery in an even and steady flow through a worm-driven power take-off with a "one step" speed reduction. There's little power loss through friction.

UNITs are easy to run because *disc-type operating clutches* provide fast, smooth response. There's no jerking or grabbing as clutches are engaged and disengaged.

UNITs are stable... don't "bounce around". The combination of *hook and turntable rollers* insure stable operation with long booms or digging attachments. With the crawler frame assembly constructed of husky side-frames and H-beam axles, the shocks and strains of heavy-duty work are easily absorbed; perfect balance and operating stability are provided.

To find out more about a UNIT, contact your nearest dealer. He'll be glad to give you complete details on any or all sizes.

SHOVELS:  $\frac{1}{4}$  Yd. to 1 Yd. • CRAWLER CRANES: 6 Ton to 22 Ton •  
DRAGLINES:  $\frac{1}{4}$  Yd. to 1 Yd. • TRENCHERS:  $\frac{1}{4}$  Yd. to 1 Yd. •  
TRUCK CRANES: 10 Ton to 40 Ton



6309 W. Burnham Street  
Milwaukee 19, Wisconsin

For more facts use Request Card and circle No. 272



Johann F. Enderlein  
Alweg Rapid Transit Systems, Seattle

CONTRACTORS AND ENGINEERS





The BBRV system of post-tensioning has a lineup of jobs and equipment mockups to put over its story at the convention exhibit.

One of the eye-catching displays by manufacturers at the show in the Brown Palace Hotel is that of Silberkuhl Construction Systems, Inc.



Two American monorail systems currently in use or under construction were the subjects of presentations by Johann F. Enderlein, Alweg Rapid Transit Systems, Seattle, and Steven Galezewski, Rockwin Engineers, Los Angeles. Enderlein described the 1.5-mile-long Alweg monorail currently being built to join downtown Seattle with the Century 21 Exposition grounds. Galezewski's subject was the 1.4-mile Disneyland monorail. Both systems employ prestressed-concrete beams to carry their trains. Strangely enough, the height of both of these speakers was described as approximately 5 feet 17 1/2 inches.

Many other speakers presented technical papers on various phases of the industry at the technical sessions. Producers and manufacturers from throughout the country pooled their knowledge and experiences in the panel discussions featured at the producers' sessions.

The manufacturers of equipment, materials, and supplies used in the prestressing industry presented their products in a series of exhibits at the Materials and Equipment Show that ran concurrently with the convention sessions.

THE END

#### Harvey Slocum dies

Harvey Slocum, well known consultant on dam construction, died early last month in India, where he had been chief consultant for that government on the nearly completed Bhakra Dam. He was 74 years old.

Mr. Slocum served as builder and consultant on many famous dams, and in 1956 The Moles, a society of tunnel and heavy-construction men, awarded him the title "The Best Dam Man in the World."

#### Chemical opens research center

Chemical Corp., New York City, opened its new Corporate Research Center in Carlstadt, N. J., last month. The laboratory and plant facilities, covering 190,000 square feet, will be used for long-range research in synthetic organic chemistry. Samuel B. McFarlane, Jr., vice president of research and development, heads the staff.



Only the clam-action 4-in-1 converts into a full-sized, full-capacity depth-controlled bulldozer. Simply open the clam, set blade segment to cut, and roll the earth—as this International Drott TD-9 Four-in-One does, leveling spoil at a Texas missile base.

## Only 4-in-1 instant "convert-ability" multiplies your earning power!

Prove the finger-tip ease and profit-ability of instantly converting the 4-in-1 to get the actions you need. Prove that only 4-in-1 "convert-ability" multiplies your earning power—that you can't afford to own a "one-job" limited-duty loader. Let your International Drott Distributor demonstrate!

International Harvester Company, Chicago 1, Illinois  
Drott Manufacturing Corp., Milwaukee 15, Wisconsin



**INTERNATIONAL**  
**DROTT**



Only the "bucket with the bite" can convert into a go-anywhere "grabhook"—that lets you sit and clam-on to hard-to-handle materials like stumps, brush, or boulders—to pile or load them under positive one-man control

No other loader converts and positions for "back-drag" grading action—to streamline bank-shaping or sloping, above or below ground level—or to pull down materials wholesale on stockpiles or in pits. Only 20 minutes with this 4-in-1 saved two days of hand labor here!



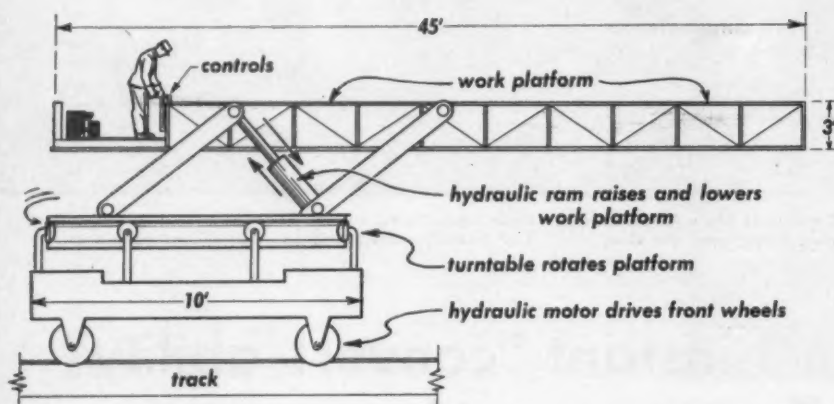
Only bucket on the market that converts into a "carry-type" scraper, the 4-in-1 lets you grade with inch-close accuracy, and bail-in material on the go. This TD-9 Four-in-One, grading grounds of a new building, gets jobs that require a variety of machine applications!



For more facts, use Request Card and circle No. 273

DECEMBER, 1961

# Strip rig saves time on two bridges



Workmen on the platform strip the forms. These are moved forward and passed up to crews atop the deck to be cleaned and reset from above.



One man handles the three hydraulic levers that control the swing, vertical motion, and travel of the rig. Pressure for the hydraulic system is supplied by the pump, left, which is driven by the Wisconsin 2-cylinder engine, rear.

**A**n ingenious rig for stripping deck forms saved time for a contractor on a pair of prestressed-girder bridges in Houston, Texas.

The contractor-built rig rides on rails beneath the deck. Men on the machine strip the forms and move them forward. The forms are then cleaned on the completed deck and set from the top of the girders.

The machine is a time-saver because it eliminates the need of ground-based equipment. In this case, the height of the bridge and the rough, wet terrain that it crosses made it difficult to use ground-based machines. In addition to stripping forms, the rig serves as a convenient work platform for men cleaning down the outside face of the bridge.

Ross Anglin & Son, Austin, designed the rig for use on two long prestressed-girder bridges on the Houston expressway system. Each of the two bridges carries four lanes of one-way traffic on Interstate 45 across White Oak Bayou. The 1,868-foot southbound bridge contains 28 spans. The 1,600-foot northbound bridge contains 36 spans. The forms spans on the longer bridge are accounted for by a 4-span, 620-foot-long continuous plate-girder section. The average span on the prestressed girders runs about 55 feet. They consist of a cap supported by four circular columns.

The engineers of the Texas State Highway Department designed the bridges. Construction was supervised by Houston Urban Expressway—a division of the state highway department. Cage Bros., San Antonio, held the \$1.9 million contract for the two bridges.

## A maneuverable work platform

The strip rig, fabricated by Seal-Press of San Antonio, cost about \$10,000 to build. The rig rode on rails about 3 feet below the bottom of the pier cap. The rails were supported by steel arms clamped to the two interior columns. The long narrow work platform of the rig moved between the columns, then swung to right or left to get into working position.

Basically this machine is a highly maneuverable work platform. The 10 x 45-foot steel-truss platform can be raised and lowered a distance of 3 1/2 feet. It can swing through 270 degrees. It can travel under its own power at a slow but steady rate.

A Wisconsin 2-cylinder gasoline engine drives a hydraulic pump that supplies power for the three motions. For the swing action, a hydraulic motor drives a 500:1 gear reducer. The output shaft leads to a sprocket that engages a roller chain attached to a fixed drum. As the sprocket moves in the chain, it gives motion to the turntable.

(Continued on page 36)



## SPICER "SPECS"

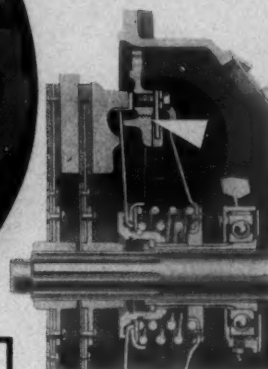
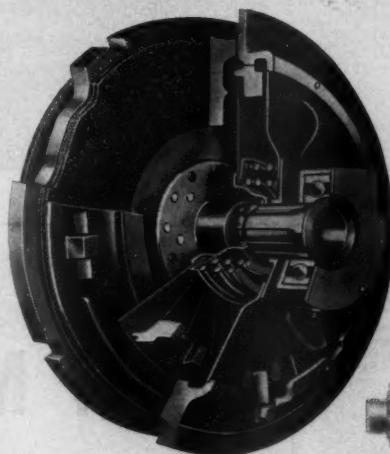
**SPICER MULTIPLE-LEVER CLUTCHES** Provide Longer Life, Less Down Time, Reduced Maintenance!

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You save money with Spicer clutches. They outlast ordinary clutches because their full circle of levers and centrally located springs provide uniform overall loading on the pressure plate, therefore are not damaged by heat. This, plus a well ventilated cover, makes the Spicer clutch cooler operating—thereby giving longer life.

The multiple levers are resilient and provide a cushioning effect. "Passenger car smoothness" of engagement reduces wear on transmission and drive line components, with the durability of rigid discs for longer life.

**Full Torque Capacity** of Spicer multiple-lever clutches is maintained by the internal adjusting ring, easily accessible through the bell housing inspection plates. This type of adjustment compensates for wear in a way that mere adjustment of external linkage cannot. "Like new" performance is obtained because the original spring pressure is restored. No special tools are required, and there is no chance of affecting the internal parallelism.



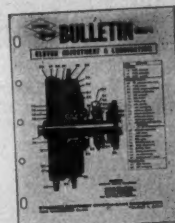
Arrow in cutaway illustration points to the exclusive Spicer Internal Adjusting Ring.

#### SPICER MULTIPLE-LEVER CLUTCH AVAILABILITIES

SIZE	NO. OF PLATES	WEIGHT (lbs.)	NOMINAL TORQUE CAP. (lb. ft.)
13"	Single	45	265
13"	Two	84	500
14"	Single	58	375
14"	Two	96	625
15 1/4"	Single	110	500
15 1/4"	Two	140	1000

For complete information on clutch adjustment and lubrication, plus helpful hints on reduction of maintenance through proper driving habits, write for a free copy of Bulletin C111-4. Address Dana Corporation, Toledo 1, Ohio.

**Easier Shifting to 1st and Reverse**—The Spicer multiple-lever clutch with exclusive pull type release makes possible the use of an effective clutch brake to stop rotation of the transmission gears. This permits shifting to first or reverse without gear clash.



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CORPORATION

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TEAR OUT FOR YOUR FILE

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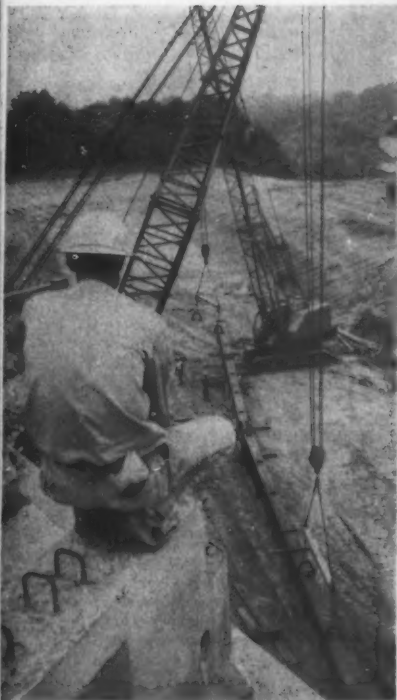
This rig, used by workmen in stripping forms from the deck of a prestressed-girder bridge in Houston, Texas, eliminates the need for ground-based equipment in a rough and wet area. The 10 X 45-foot steel-truss platform can be raised, lowered, and swung from one side to another, and the entire rig rides on rails under its own power. Designed by the contractor, it was built to spec for \$10,000.



The carriage of the rig, with the turntable that swings the work platform, rides on rails set 14 feet apart and connected by angle-iron cross bracing. Plate girders are on steel arms supported by sleeves that are clamped around the columns.



Plywood deck forms rest on 2 x 4's that are supported by double 2 x 6's. These in turn are supported by screw-type jacks on double 2 x 4's that span between the lower flanges of the girders.



A 180-foot-long plate girder is jockeyed into position by a Koshring 605 and a Bucyrus-Erie. The girder is built with dog-leg to fit the curve of the bridge.

(Continued from page 34)

Two hydraulic rams with a 5-foot stroke raise and lower the platform. Two pairs of parallel arms, connecting the work platform to the turntable, insure that the platform is always in a horizontal position. (See sketch on page 34.)

When the rig has to be moved along the rails, a hydraulic motor working through a gear-reduction box drives the front two wheels. Each of the four wheels is made of a 12-inch steel-pipe section with pie-shaped pieces welded to the open sides to make the flanges.

#### Hydraulic controls

One operator manipulates three hydraulic levers to control the rig. He stands above the turntable in a sunken operating area. In this area are the gasoline engine and the hydraulic pump. The rig weighs 9,000 pounds and can handle loads up to 3,000 pounds.

The two plate-girder rails on which the rig rides were built up from 30 x 1/4-inch web plates and 4 x 4 x 3/8-inch angles. The rails, which were



set 14 feet apart, were connected by angle-iron cross bracing. Each plate girder rested on a steel arm supported by two sleeves clamped around the column. The longest span that the rails had to make was 70 feet.

The rig was not used to strip the forms under the plate-girder spans of the southbound bridge. The long spans and the change in column spacing made the use of the rig impractical. On these spans, men stripping the forms worked from plants resting on the bottom flange of the 6-foot-deep girders.

Generally, two men rode the rig. One man operated the controls and

## NEW METHODS, NEW MACHINES PUT SECTIONS OF INTERSTATE 40%





assisted the other man in wrecking out the forms. After the rig was loaded with forms, it was moved forward to a point where the forms could be passed up to the top side. Here the forms were cleaned and then reset. The rig assisted in the setting of forms for diaphragms.

#### Deck forms

The deck forms were easy to set and knock out. They were supported by a double 2 x 4 resting on the lower flange of the concrete girder. From this lower member two Williams screw-type jacks rose to a double 2 x 6. These three members—2 x 4's,

jacks, and 2 x 6's—were tied together as a unit and set on 4-foot centers. The supporting units carried 2 x 4's, on 16-inch centers, that held the plywood.

For a concrete-girder bridge, the southbound structure had some big and tricky steel-girder lifts. The span crossing the bayou required 180-foot plate girders to be placed on pier tops about 50 feet above the ground. To accommodate a curve in the roadway, the 6-foot-deep plate girders had a dog-leg built into them.

Before being lifted, the 23-ton girders were stiffened with hog rods. Temporary towers of Waco tubular

scaffolding were erected to support the girders at the dog-leg. Two cranes, a Bucyrus-Erie 54-B and a Koehring 605, worked the unwieldy girder into position. Then—slowly, carefully—the crane operators guided the girder to the pier tops.

#### Personnel

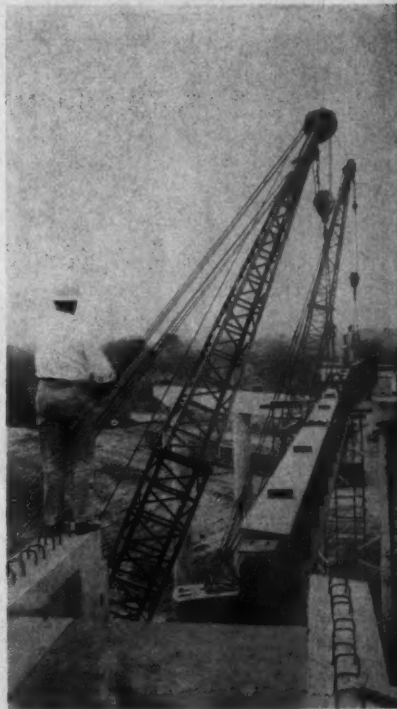
Ross Anglin, Jr., project manager, is the designer of the strip rig. He often visited the project, where Horace Ivy was superintendent. For the Texas State Highway Department, Neal Joyner is senior resident engineer and Don Byne is resident engineer.

THE END



Movements of the Koehring and Bucyrus-Erie cranes are synchronized by Floyd Wade with hand signals as the 180-foot girder goes up.

Concrete meets steel as the girder is set in position by the two cranes. The strip rig does not work under the continuous steel-girder section.



#### M-C&S film depicts century of progress

Merritt-Chapman & Scott Corp. has produced a 16-mm, 36-minute sound and color film titled "Our Pioneering Heritage." Narrated by TV commentator Chet Huntley, the documentary covers 100 years of America's economic expansion.

Free loan prints are available to adult organizations and colleges from Association Films, Inc., regional libraries: Broad at Elm, Ridgefield, N. J.; 561 Hillgrove Ave., La Grange, Ill.; 799 Stevenson St., San Francisco, Calif.; and 1108 Jackson St., Dallas, Texas.

For more facts, use Request Card and circle No. 275

# 40% AHEAD OF SCHEDULE...

## Tandem loading with new power shift D9G speeds job for Greer Bros. & Young

The job is a big one: 5,000,000 yards to be moved in two adjoining sections of Interstate 75, just out of Jellico, Tenn. Terrain: hilly. Haul distance: 1600 feet. Soil: mostly clay and shale, with considerable ripping required. Time schedule: 300 days.

The London, Ky., firm has teamed new machines with new methods to meet the challenge. For example, the use of tandem pushers has resulted in 21 bank-yards (on adverse grades) in .8 of a minute. In this case, a new 385 HP D9G Tractor was used in tandem with a D8H to load out new Cat 631 Tractor Scrapers.

"Tandem loading production has been boosted 5% with this D9G, as compared with an older torque converter D9," reports W. C. Howard, chief engineer on the job.

"We notice a big difference in power, weight and traction with this new machine. Cushion bulldozer and push block help, too. They give us on-the-go scraper contact—this cuts down on approach time. By reducing contact shock, we expect better scraper life. Tandem loading with the new D9G has helped us pull 40% ahead of schedule."

The new D9G has a number of pluses that make it right for dozing and ripping, as well as pushing. Here are only a few:

Engine delivers 385 flywheel HP—100 more horsepower than the first D9... weight is 64,800 pounds, 14% more than the first D9... a massive,

heavy-duty undercarriage lets the D9G take on the toughest ripping job... a power train with built-in ruggedness also has unit construction for fast servicing.

The D9G has Torque Divider Power Shift as standard equipment. This exclusive Cat feature combines the efficiency and snap of direct drive with the load-matching and anti-stall characteristics of torque converter. A single lever gives the operator finger-tip control of his machine. It means faster cycle times and greater efficiency. You get more out of the machine all day.

There's only one way to evaluate the D9G. Check it on the job. Your Caterpillar Dealer will be glad to make arrangements.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U. S. A.



Greer Bros. & Young also use the D9G, equipped with 9C Dozer, to clean up the cut.

# CATERPILLAR

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## Cofferdam work goes swiftly on ice

Working on a cofferdam for a bridge pier after chewing its way through the ice in Lake Sanford, Mich., with a clamshell, a barge-mounted crane prepares to drive one of the steel H-piles that will hold the tall reinforcing cage. Men could walk across the ice to the site, materials could be hauled across, and staking was convenient.

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In northern Michigan, fishing through the ice is a common pastime. Working through the ice is something else again.

Brown Bros., contractor of Lansing, Mich., saved a good deal of time by driving four sheet-pile cofferdams through the ice. Surprisingly, working through the ice had numerous advantages:

1. The over-the-ice route to the cofferdams greatly facilitated the supply of materials to the job. Instead of being barged to the site, sheet pile and concrete were easily hauled over the ice to the cofferdam.
2. The job had most of the conveniences of a dry-land operation. Men didn't need to get into a boat every time they wanted to get out to the work. They could walk from cofferdam to cofferdam.
3. The ice made staking out the bridge more convenient for the field engineers of the Michigan State Highway Department. The engineers made direct measurements and set points on the ice. Had the cofferdams been surrounded by water, an involved triangulation system would have been necessary.

### Good production

Between the middle of January and the first of March, Brown Bros. drove and excavated four 38 x 14-foot cofferdams, and completed the four tremie pours (850 cubic yards) and one stem pour (58 cubic yards). According to the superintendent, this amount of work would have taken nearly twice as long had the cofferdams been surrounded by water.

The twin bridges will carry the four lanes of relocated U. S. 10 over Sanford Lake near Sanford, Mich. The built-up steel-girder bridge contains three spans—a center span of 136 feet flanked by two spans of 160 feet.

The four concrete piers rise through about 25 feet of water. One abutment rests on the end of a 1,400-foot-long water-surrounded approach fill. The other abutment rests on a 300-foot-long fill. At the time the cofferdams were driven, the approach fills had not been built.

Each of the piers is founded on a 10-foot-thick tremie footing resting on hard clay. The 19-foot-high rectangular stem rises directly off the tremie concrete. A construction joint separates the stem from the 10-foot-

CONTRACTORS AND ENGINEERS

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The crane worked from the barge during the cold months, since even the 18 to 22-inch-thick ice was not enough to support its weight. Two of these steel H-piles will hold the tall reinforcing cage in position. The cage will extend from the bottom of the tremie to the top of the cap.



## Construction of four cofferdams

handled in winter in half the time that would ordinarily be required

high cap. Vertical reinforcing steel, in a single cage, extends from the bottom of the tremie to near the top of the cap.

### Crane works from barge

Although men and materials traveled over the ice, the contractor's Northwest Model 6 crane worked from a pontoon barge. The 18 to 22-inch-thick ice, particularly in the vicinity of the holes for the cofferdams, was not considered sufficiently strong to support the weight of the crane.

The four sections of the 32 x 72-foot steel barge were assembled on the ice near the shore. Working on the ice was a convenience, for men had little difficulty making the underside connections. After the barge was assembled, ice was broken around it permitting it to float. Then the crane was walked onto the barge from a temporary dock on the shore.

By breaking a path through the ice with a clam, the barge-mounted crane made its way out to the work area—a distance of about 800 feet. The barge was propelled by a Harbor-master "outboard" motor.

### Cut hole for cofferdam

Using stakes frozen into the ice, men set a 38 x 14-foot timber wale as a guide for driving the sheet pile. With a power saw, they cut a hole around the wale. The edge of the hole was about 2 feet outside the wale. Using a clamshell, the barge-mounted crane cleaned out the ice from the hole. The timber wale was held in position by bracing against the edge of the ice surrounding it.

The 50-foot-long Z-32 sheets were dragged over the ice to within reach of the crane by a Michigan 125A rubber-tire loader. The sheets were jettied through the sand and silt and then driven through clay by a McCormick-Terry 9-B-3 hammer. Steam from a shore-stationed boiler. After the sheets were driven, a clamshell excavated about 250 cubic yards of material from the cofferdam.

### H-piles guide cage

Before the tremie was placed, a heavy reinforcing cage had to be set in position. The 7-ton cage extended from the bottom of the tremie to near the top of the cap. It was held

(Continued on next page)

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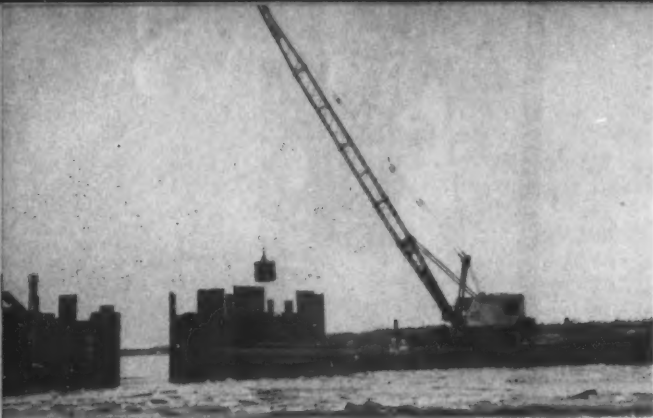
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The crane buckets concrete to the pier stem. In this instance, concrete is carried in buckets on the barge. Generally, buckets were carried to the crane by fork-lift or on sleds.

in position by two steel H-piles. The piles were driven first, and then the cage was set down over them. Piles were pulled before the tremie concrete hardened.

Several methods were employed to get the concrete from the shore to the cofferdam. The most obvious method of driving the transit-mix trucks out on the ice was considered too risky. Although the superintendent figured the ice was strong enough, the ready-mix producer didn't want to risk his trucks on the contractor's judgment.

#### Sleds for concrete

As an alternative, a Michigan 125A equipped with a fork-lift carried two 1-yard buckets at a time from the shore to the cofferdam. In another arrangement, two buckets were pulled over the ice on a sled by a winch cable. In this device, two sleds and a continuous cable were used. While one sled with two full buckets was being pulled out, the other sled with two empty buckets was being pulled in. The continuous cable worked from one winch.

#### Driving stakes in the ice

Working on the ice not only saved the contractor time; the frozen water made it more convenient for the field engineers of the state highway department to stake out the bridge. Instead of using triangulation, chaining was done directly on the ice. Chainmen drove 8 penny common nails into the ice for reference points. Their position was checked occasionally, but there was seldom any appreciable movement of the points. Maximum movement of one particular point was .02 foot, but this was unusual. When a wooden stake had to be driven in the ice, a hole was first augered out; then the stake was set in the water and allowed to freeze in position. These temporary points on the ice greatly facilitated the setting of permanent reference points on the lake shores.

#### Personnel

Bruce Love, the general superintendent, found the ice made a convenient landing strip for his Cessna 182 single-engine plane. He occasionally dropped in to check with the job superintendent, John Hill. The resident engineer for the state highway department was Gerald Casey.

THE END

## Rust exhibit demonstrates construction specialties

Models demonstrating the use of soil compaction by Vibroflotation for building foundations, and the construction of radial brick chimneys, were exhibited by the Rust Engineering Co., Pittsburgh, at the Industrial Building Exposition in New York City this fall.

Concrete chimney models showed cutaway sections of three different types of linings—free standing, corbel, and a new type of steel lining. Factory foundations on presettled

sandy soil with soil compaction by Vibroflotation were illustrated by a Vibroflot machine model and a diagram showing how compaction is accomplished by simultaneous saturation and vibration of granular materials.

High load-bearing capacity has been achieved by this method for factory sites in the country, giving a uniform foundation at a substantial cost saving over the use of piling or other foundation solutions.

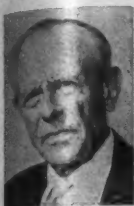


Nar

Dr. Karl  
F. Ferrie  
1962 av



## Names in the News



### Terzaghi and Ferris voted Moles' awards

Dr. Karl Terzaghi, internationally known pioneer in soils mechanics, and George F. Ferris, board chairman of Raymond International, Inc., New York City, have been named the 1962 recipients of awards given by The Moles for "outstanding achievements in construction."

Dr. Terzaghi, the non-member winner, is well known as a teacher and

practicing engineer. Some of the projects on which he has served are the Chicago subway; the subsidence of Mexico City; and construction of Kenney Dam in Canada, the Sariyar and Seyham dams in Asia Minor, and the Serre Poncon Dam in France.

Ferris was awarded the Navy's Distinguished Public Service Award for directing a massive program of air-base construction in the Pacific during the war years. Since he joined the Raymond company in 1946, he has directed a base program in Spain, the Hyperion outfall project off Los Angeles, and the bridge-and-tunnel crossing of Lower Chesapeake Bay.

### New member appointed to 1963 Road Show committee

Lynn Campbell of the Associated Construction Papers has been named to the Publicity and Public Relations Committee of the 1963 Construction Equipment Exposition and Road Show. The appointment was made by joint chairmen Donald V. Buttenheim, president of Buttenheim Publishing Corp., and Harvey A. Scribner, who announced that George Stewart, formerly of *Construction* magazine, had resigned from the committee.

The show, which is the world's largest industrial exhibit, will be held February 23 to March 1, 1963, in Chicago's International Amphitheatre.

### Perini promotes two

The Perini Corp., Framingham, Mass., has elected D. C. Cannon executive vice president of engineering and construction, with headquarters in the home office.

Succeeding him as president of



D. C. Cannon, left, executive vice president of engineering and construction, Perini Corp., and Joseph R. Perini, Jr., president of Perini Quebec, Inc.

Perini Quebec, Inc., is Joseph R. Perini, Jr., who was also elected vice president of Perini Ltd., Toronto; Perini Western Ltd., Edmonton; and Perini Pacific Ltd., Vancouver.

### ACI grants charter to Hawaii chapter

Alfred A. Yee, head of Alfred A. Yee & Associates, structural engineers of Honolulu, has been elected president of the new Hawaii Chapter of the American Concrete Institute.

Other officers are vice president Tautomu Izumi, who is superintendent of building, City and County of Honolulu; and secretary-treasurer J. Bruce Vesey, who is president, Construction Products, Ltd., Honolulu.

### New bridge engineer

Bernard H. Langley has been promoted to the position of bridge engineer by the New Hampshire Department of Public Works and Highways. He had been assistant interstate bridge engineer.

### Rust elects director

Henry C. Goodrich, vice president of The Rust Engineering Co., Pittsburgh and Birmingham, has been elected to that company's board of directors. He has been with the firm since 1946.

Why this bearing runs cooler with Amoco Lithium Grease is explained by American Oil representative Harold Jansen to Raid Brothers' superintendent Kenneth Pearson and partner Melvin Raid.

### Result of first experience with American Oil Company service—down-time reduced



BY HAROLD JANSEN

**About the Author.** Harold Jansen has eleven years' experience giving lubrication technical assistance to customers. He has a degree in engineering to qualify him for such work in addition to having graduated from the Company's Sales Engineering School.

★ ★ ★

Bearings were running hot in the rock-crushing equipment at Raid Brothers aggregate plant, Denmark, Iowa. This reduced the speed at which the equipment could operate.

Our lubrication specialist who called on this account before me recommended a switch to Amoco Lithium Grease. The grease reduced bearing temperatures, got the bearings running smoothly, upped operating speeds and plant efficiency and cut down-time. The success with this grease, and with the technical assistance we were able to render here, resulted in Raid Brothers converting their entire plant, including automotive equipment, to American Oil products.

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You can get this kind of technical help and performance improvement from your equipment. Just call the American Oil Company office near you.

#### Quick facts about AMOCO Lithium Grease

- Capable of providing superior lubrication over a wide range of conditions.
- Water resistant.
- High temperature resistant.
- Pumpable in grease gun or pressure system.
- Mechanically stable.



**AMERICAN OIL COMPANY**

910 SOUTH MICHIGAN AVENUE  
CHICAGO 80, ILLINOIS



For more facts, use Request Card and circle No. 280



Stockpile of pipe joints alongside a temporary road of concrete blocks joined with wire.

*Three joints welded together permits*

## Laying 157-foot pipeline

by WILLIAM H. QUIRK, editor

Welding pipe joints together at the base camp with an automatic welding machine. Welding is done from the top as the pipe is rotated slowly on rollers. Each weld is later checked by X-ray for flaws.

A new crude-oil pipeline is currently being laid in an east-west line across the breadth of Poland. This 670-kilometer (416-mile) stretch is part of a vast 2,876-mile network of pipe that will extend from Ural oil sources deep in the Soviet Union across Poland into East

Germany, with other branches running off into Czechoslovakia and Hungary. Work on the Polish section got under way in May, 1960, and is scheduled for completion late in 1963. Construction of pumping stations at required intervals is also in progress.

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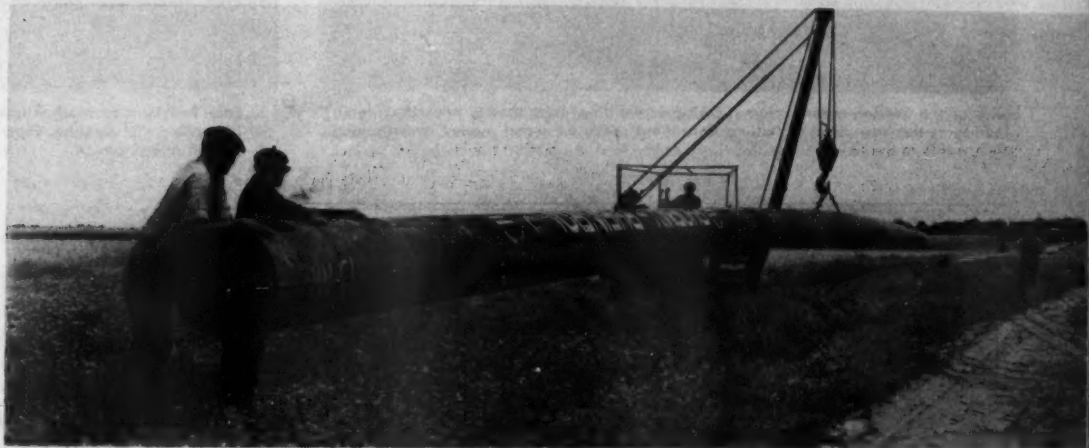
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The pipeline is laid out to enter Poland near the Russian border city of Brest, to cross the flat central plain about 20 miles north of Warsaw, and to leave Poland at the East German town of Schwedt on the Oder River. Soil in this lowland plain

(Continued on next page)



One 157½-foot section of pipe has been loaded on the truck, as a crawler tractor with side boom is lifting another into place. The truck is a Tatra, made in Czechoslovakia. Far end of the pipes is supported on a carriage.



Out in the field the pipe sections are unloaded and placed in line by a crawler with side boom. Steel pipe for the project is furnished by Phoenix-Rheinrohr of West Germany.



The long sections of pipe are welded together in the field. While the pipe is strung out on the ground, access to the joint is obtained by digging a hole for the welder to work in. The truck carries the welding unit.



A Stalina Russian-built tractor holds a pipe length off the ground with its side boom, hook, and pipe collar so that any traces of mill scale or rust may be removed.



A final check of the coated pipeline is made with a holiday detector against any possible defects. When the final okay is given the trench is backfilled.



One of the Russian-made automatic electric welding units that is housed under a lean-to at the base camp. Welding done here saves time and money over making such welds in the field.



Four Polish-made Madro tank trailers heat the asphaltic-rubber compound used in coating the pipeline. Pipe is being lowered into a trench directly behind the spread of equipment.



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(Continued from preceding page)

is a combination of sand and loam, and the terrain is mostly farming country interspersed with pine forests. Trenching machines encountered little difficulty in excavating for the 5-foot average depth of the pipeline. While rock was absent, ground water proved troublesome at times.

Poland is obtaining steel pipe from Phoenix-Rheinrohr with headquarters in Dusseldorf, West Germany. It is rolled in 16-meter (52.5-foot) lengths of 630-mm (24.8-inch) diameter, and with wall thicknesses varying from 7 mm (.28 inch) to 16 mm (.63 inch) according to location and conditions encountered. At major highways, the pipe is jacked under the road, while lesser highways are crossed in open cuts as detours are provided. Pipe lengths are shipped by rail from West Germany to sidings in Poland closest to the route of the pipeline.

Three different crews of state contractors, each operating from its own base, are laying the pipe. These crews

are scattered across the location line. One such crew, based for a time this summer near Plonsk, north of Warsaw, ran a typical operation.

It was working on the eastern leg with the two other crews strung out to the west. Its base was in the open country and consisted of a storage area where pipeline joints were stockpiled, a lean-to that furnished protection to two U.S.S.R.-made automatic electric welding machines, and 86 trailers that served as laboratories, maintenance shops, parts depots, and homes for most of the 260 men comprising this particular crew. Those living in the neighborhood journeyed back and forth to work by bus, car, or motor bike.

Around the stockpiles of tubing, paved roads were laid out so that trucks with their heavy loads of pipe would not get mired during a rainy spell. The pavement consisted of precast reinforced-concrete blocks strung together in sections with light

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CONTRACTORS AND ENGINEERS





A field overhaul is given the pipe-wrapping machine. Large spools on the left end of the rig hold the ribbons of fiberglass that is wrapped around the pipe. Three separate spreads are at work on this pipeline project.



At the pipeline crew's field base near Plonsk. Two of the 86 trailers that provide laboratories, shops, and quarters for the men. Mats of precast-concrete blocks, strung together with wires, are laid out as a pavement for the trucks.

flexible wire. This permitted easy assembly of pavement sections, and also fast loading into trucks when it came time to break camp and move the base to another location. Trucks towed the trailers to each new setup.

After pipe had been laid 10 kilometers (6.2 miles) both east and west from the base camp, a shift would be made to a new location, 20 kilometers farther along the line. The entire operation would proceed until a similar stretch of pipe was in the ground. Last year, after a slow start and delivery difficulties, the crew completed 30 kilometers of pipeline. This year the crew will lay about 60 kilometers, and it expects to put in place next year about 120 kilometers (74.6 miles) of pipe.

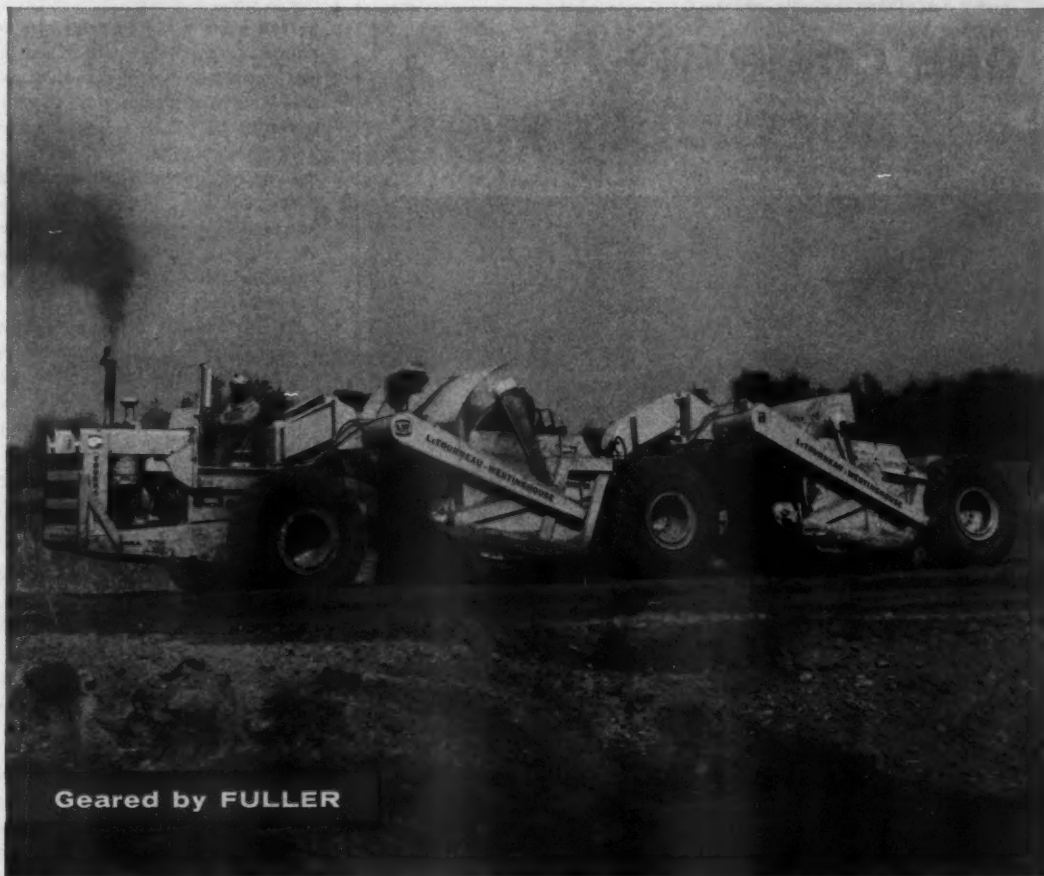
#### Triple jointing

To speed the project along, the Poles are welding together at base headquarters three 16-meter pipe joints into a single 48-meter-long (157.5-foot) section. This triple jointing at the base shop with speedy automatic welding machines is, of course, faster and more economical than welding by hand in the field. Welding is done from the top as the pipe rotates slowly on dual-wheel supports fixed to I-beam rails anchored in the ground. X-rays of each weld are taken with a detectoscope and films are developed in a trailer-housed laboratory. This rigid checking insures the maintenance of high welding standards.

Stalina (U.S.S.R.) crawler tractors equipped with side booms pick up the long welded sections for loading out to the right-of-way. Hauling is done by Tatra (Czechoslovakian) truck-tractors equipped with cradle-type frames built over the chassis behind the cab. Pipe ends for three sections are secured to this frame. The other support of the pipe sections is an 8-wheel carriage, also equipped with a cradling frame. No intermediate supports are needed.

At the location site other heavy tractors, with side booms, hook, and sling, unload the long sections directly on the ground so that they butt up against the preceding section. A hole is dug in the ground at this point, deep enough for a welder to get into and make his stringer bead and hot-

(Continued on next page)



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(Continued from preceding page)

pass welds. A truck carries an electric welder along from joint to joint.

Next, any traces of mill scale or rust are removed from the pipeline by a mechanical cleaner, as the side-boom tractors support the pipe off the ground. A succeeding operation with a coating machine applies a treatment of asphaltic rubber. Four tank trailers supply the hot compound. Next, a wrapping rig encases the pipe in a layer of fiberglass. The pipe is again carefully inspected with a holiday detector that checks the coating for any possible defects. Back-filling completes the job. Four tractors with side booms handle the pipe, the various rigs, and tow equipment along the line.

THE END

## Avoid legal pitfalls

### Delayed contractor sues state highway department

**THE PROBLEM:** A state highway construction contract provided that the contractor would not file a claim against the highway department for additional compensation for delays or conditions created by other contractors, and that payments made according to the contract covered all risk and expense of delay. Could the contractor assert a claim for delay

against the department on the facts presented?

**THE ANSWER:** No. (Humphreys v. J. B. Michael & Co., 341 South Western Reporter, 2d, 229, decided by the Kentucky Court of Appeals.) However, three of the judges dissented from the majority decision.

The majority opinion reasoned that, generally, a party to a contract who is not precluded by its terms from asserting a claim for damages due to delay may recover damages if he can show that the delay was a breach of some express provision of the contract or of an implied obligation. This rule, when applied to contracts let by public bodies, assumes that the work of the contractor was delayed, that the contractor was damaged by the delay, and that there was default on the part of the public authorities. If any of these conditions are absent, recovery of damages by the contractor will be denied.

The contractor had been granted extensions of time to complete work on the project and the highway department waived the collection of liquidated damages. The contractor claimed he was entitled to recover damages, notwithstanding the no-damage clauses of the contract, because the defendant actively interfered with his work. (The active-interference doctrine was recognized and applied in American Bridge Co., Inc. v. State, 245 App. Div. 535, 283 N.Y.S. 557.)

The court ruled that the highway department had not issued an order or directive to the contractor to continue to keep his personnel and equipment at the job site in a state of readiness. Although the contractor was assured that the grade would be ready for paving as scheduled, he was left free to make his own decision concerning the use of personnel and equipment.

One of the dissenting judges held that he could not avoid the conviction that if the commonwealth were not involved the decision would have been different. . . . This litigation would not have arisen had the contract included even one simple, direct, categorical sentence stating explicitly that the highway department would not be responsible for delays resulting from the delays and defaults of other contractors.

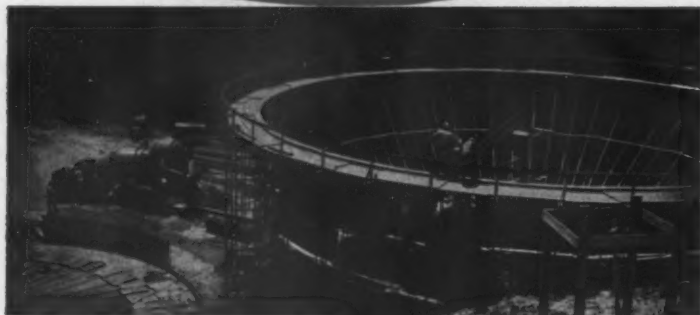
### Crediting of payments

**THE PROBLEM:** A contractor supervised construction for a housing-development company under an agreement that the contractor should be paid a certain sum for each house supervised, plus a bonus of \$10,000 if all the houses were completed within a year. They were so completed, and

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

the company later issued checks to the contractor totaling \$10,000 and the contractor credited them against the bonus claim. Later, the contractor filed mechanics' lien claims against the properties involved. The claims were resisted on the ground that the payments made to the contractor should have been credited against what was due for lienable services that were rendered and not against the sum due as a bonus. Was the

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CONTRACTORS AND ENGINEERS



housing company entitled to have the payments recredited in reduction of the Henable claim?

**THE ANSWER:** No. (Toll-Barkan Co. v. Toll, 164 Atl. 2d 36, decided by the Pennsylvania Superior Court.)

The court said that the case came within this general rule of law governing the crediting of payments by a debtor: The debtor has a right, when he makes a payment, to direct how it shall be credited, as between different items of his indebtedness. If he does not exercise that right, the creditor has a right to choose the item to be credited. If neither party exercises his right, it is impliedly understood that the earliest indebtedness is to be credited. In this case, when the housing company sent checks to the contractor without directing how they should be credited, the contractor rightfully credited them against the bonus item.

### Contractor sues for cost of dewatering site

**THE PROBLEM:** Plaintiff, as low bidder on a municipal building job, was awarded the contract. The site was near a river. On completion, plaintiff sued the city for the extra cost of dewatering the site, made necessary by the city's change in concrete-footing plans, placing most of the footings below the ground water table. Did governing facts and contract clauses entitle the contractor to a readjustment of the contract price?

**THE ANSWER:** No. (Thomsen-Abbott Construction Co. v. City of Wauwatosa, 100 N.W. 2d 921, decided by the Wisconsin Supreme Court.)

The court ruled that the contractor was entitled to be paid only the agreed unit price.

But the court ruled against the city's contention that the contract was void on the ground that inclusion of Article 15 of the A.I.A., General Conditions, voided the contract as violating a state statute requiring public contracts to be awarded to the lowest bidder. Article 15 reads: "The owner, without invalidating the contract, may order extra work or make changes by altering, adding to or deducting from the work, the contract sum being adjusted accordingly. . . . Should conditions encountered below the surface of the ground be at variance with conditions indicated by the drawings and specifications, the contract sum shall be equitably adjusted upon claim by either party made within a reasonable time after the first observance of the conditions."

However, upholding another contention by the city, the court decided that dewatering expense to which the contractor was put, as the result of a change order deepening the footings, was not governed by the contract provision for adjustment of price if conditions encountered below the surface of the ground were at variance with conditions indicated by drawings and specifications. It was governed by a provision setting a price of \$74 per cubic yard for additional or less concrete on the basis of unit price for concrete foundations as submitted by the contractor with

his proposal, in event of a difference between final depth of foundation and that shown on the drawings. A certain amount of dewatering was contemplated by the contractor in his original bid, and thus, laying of footings at a greater depth did not require employment of any different method of construction.

### Excavation contractor's rights on yardage basis

**THE PROBLEM:** Did an excavation subcontractor, who was to be paid on a cubic yardage basis on state highway construction, prove his right to more pay than the prime contractor admitted was due?

**THE ANSWER:** Yes. (Grady v. S. E. Gustafson Construction Co., 103 N. W.

2d 737, decided by the Iowa Supreme Court.)

The court ruled that because it had been agreed that the general contractor would cross-section the excavation areas to determine the cubic yardage hauled, and that the subcontractor would furnish a load count, each party was bound to do these things with reasonable promptness. The suit was not prematurely started where the general contractor did not explain a 4-month delay in signing the final estimate after the work had been completed. The subcontractor's claim had been filed three months after job completion.

But it was up to the subcontractor to prove how many yards were excavated by proof stronger than the opposing evidence.

The contract read: "Contractor will cross-section channel and borrow and pay subcontractor for actual cubic yards excavated." But the court said that the contract did not exclude other methods of computing the subcontractor's compensation where there had been no cross-sectioning, or if there had been incomplete or inaccurate cross-sectioning. The court's duty was to ascertain as nearly as possible the yardage actually excavated. But to the extent that there was accurate cross-sectioning, it was conclusive as to yardage excavated. Field notes prepared by employees of the state highway commission as part of the work and kept as part of the public records covering the job could be used in determining the quantities excavated.



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**The Arctic winter  
will supply the cold  
to freeze an impervious**

**Permanent frozen core a**



**A dream comes true  
for Arnold J. Hanson—  
dam with frozen core  
near Fairbanks, Alaska**

In handling the engineering design and details of this particular project, Hanson is not only depending on the cold weather in the area for help; he's also brought some lively imagination and ingenuity into play to help solve his practical problems. Most of the scrap pipe, for instance, bought by Hanson and his associates for a price it would bring as scrap, was used in another project, but a portion of it is also going to find use in the new dam. This job is going to be a practical one—as practical as Hanson himself.

Arnold J. "Arnie" Hanson is a friendly, yet quiet and unassuming, man. He is not large of stature, but those who listen to him know that his words carry real weight. Born and raised in Montana, he received his B.S. degree in civil engineering from Montana State College at Bozeman.

After working for the Corps of Engineers on the Fort Peck Dam project in his home state, Hanson came to Alaska on military construction during World War II. He spent two years out in the cold and fog of the Aleutian Islands before moving to the more pleasant climate of Fairbanks in 1946. After serving in this area with several contractors, he joined the newly organized contracting firm of Reed & Martin, with which he still serves as area manager in the Fairbanks area.

His work here has included a number of projects at Ladd and Eielson Air Force bases, as well as bridge and utility projects for non-military agencies. Through these experiences, Hanson has become well acquainted with the Arctic and sub-Arctic conditions that prevail throughout the area. Since he has learned to work with these conditions instead of fighting them, it is not surprising that he calls on the cold of the Arctic winter to aid him in building this frozen-core dam.

The cold Arctic winter weather may be put to work building the impervious frozen core of a gravel-fill dam near Fairbanks, Alaska, on a job currently scheduled for construction in 1963.

The project, the dream of a Fair-

banks construction engineer, advanced a step nearer to reality this fall with the submission of a proposal to the two utility systems in the Fairbanks area for the sale of the electric power the project will produce.

Conceived by Arnold J. Hanson,

area manager for the general contracting firm of Reed & Martin, the plan calls for a structure, 145 feet high and 1,400 feet long at the crest, built almost entirely of gravel. The impervious central core, with a minimum width of 30 feet, would be

frozen by weather that has heat—Hanson well casing gravel the minimum



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# core a gravel-fill dam

By RALPH MONSON, field editor

frozen by the naturally cold winter weather through a system of ingenious heat-exchanging units. Hanson will drive 4-inch capped well casings through some 25 feet of gravel that underlies the site and a minimum of 5 feet into the underly-

ing rock, a weathered shale. A portion of this thick gravel stratum in the valley is already permanently frozen, since permafrost underlies most of this area. The pipes will be spaced approximately 10 feet apart in three parallel

rows across the axis of the dam. The rows will be spaced at least 10 feet apart to develop the minimum core width of 30 feet. Each pipe will be sealed at both ends with three outlets provided near the top. Inserted through one of these

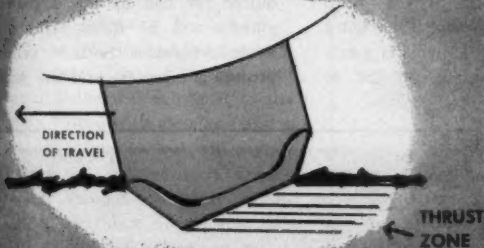
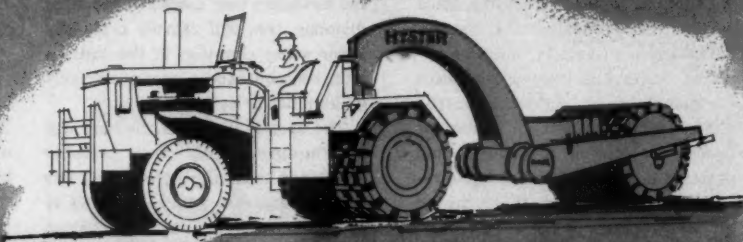
openings will be a 1-inch plastic pipe that will extend down to the bottom of the casing. It will carry a coolant—such as ethylene glycol—from a circulating pump to the casing bottom. A second outlet will return the coolant from the top of the pipe through a radiator (unit heater) to the circulating pump. This might be a small ½ or ¾-hp unit on each pipe, or a larger central system may be used to dissipate the heat. The third outlet will lead to a surge chamber that will compensate for the

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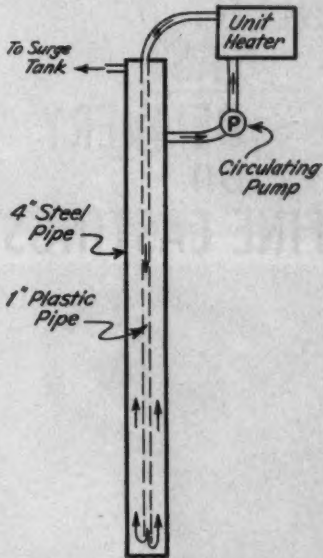
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Four-inch steel casings will be driven at 10-foot centers to provide the freezing elements for the frozen core of a proposed dam near Fairbanks, Alaska. Each casing will have a 1-inch plastic pipe inside to deliver the coolant to the bottom. As the coolant rises through the steel casing, it will extract heat from the surrounding material and freeze the saturated gravel core. A small circulating pump and a radiator (unit heater) provide the circulation and dissipate the heat into the air.

expansion and contraction of the coolant.

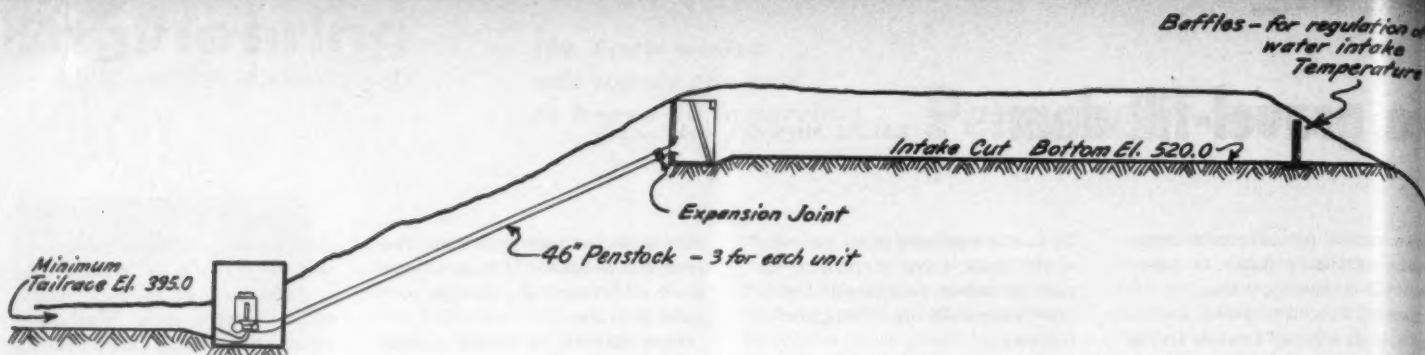
Operated at times when the air temperature is below 20 degrees F (probably 150 days per winter), the pumps will force the cold coolant to the bottom of the pipes. Here it will freeze the surrounding ground as it rises through the 4-inch casing, absorbing heat from the surrounding materials. At the top, the warmed liquid will give up its heat to the cold air as it passes through the radiator on the continuous cycle. The pumps will simply circulate the coolant. No compressors or other artificial freezing devices will be used.

Since the frost is known to penetrate rapidly through gravel strata, Hanson believes the saturated gravel core will become an impervious frozen mass in a few weeks. This core would have adequate cover to provide insulation against the summer heat except in three specific areas where

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This section indicates the arrangement of the power canal leading the water around the right end of the dam and into the penstocks. The tailrace will extend a mile downstream to gain a little extra head. The material for the dam comes from this excavation.

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(Continued from preceding page)

special methods would be used.

Obviously, the frost could not be maintained where the core is exposed at the top of the dam. Here, Hanson will substitute a conventional impervious earth core for a depth of about 15 feet. This will provide watertightness to the top and will serve as insulation over the frozen core below.

A second troublesome spot is anticipated where the diversion pipe, a 10 or 12-foot corrugated-metal pipe, passes through the core. The third area of possible difficulty is in the vicinity of the open channel, which will lead the water from the reservoir to the power-plant penstocks. Both of these areas may have to be fitted with artificial refrigeration systems.

The freezing systems would be operated during the two winters while the dam is under construction. The system would be left in place for future use during any succeeding winter if it should be necessary to re-freeze any portion that thaws during the summer.

The entire core area will be carefully instrumented with thermocouples that will provide continuous information on the temperatures at key points inside the structure. Both the U. S. Army Corps of Engineers and Bureau of Reclamation have in-

dicated their interest in the project and may cooperate in the instrumentation as a means of studying the behavior of the frozen core.

## Constructed of gravel

In construction, the contractor will first strip off the relatively shallow overburden exposing the gravel stratum on which the dam is founded. He will drive the three lines of casings through the gravel and into the underlying rock.

The dam will be built up in compacted layers of gravel excavated from the powerhouse tailrace. Taking the material from the tailrace will extend the tailrace downstream about a mile. Since the natural river channel meanders over a somewhat longer distance, this will provide a slightly lower water elevation in the tailrace and, consequently, a correspondingly greater head.

The upstream face of the dam will be rippedraped with rock probably scavenged from the excavation. The downstream face will be planted to sod, moss, and other native vegetation that will help provide insulation against the summer heat. Summer temperatures may reach 100 degrees F.

The complete structure will require approximately 2 million cubic yards of material—practically all of it

gravel. The upstream and downstream slopes may be slightly steeper than those usually found on earth-fill structures because the frozen core will provide a great deal of stability in itself.

The project will be financed, built, and operated by the Chatanika Power Co., Inc., a corporation organized by Hanson and some of his associates to build another power project a few years ago. It will be located on the Chatanika River some 25 miles northwest of Fairbanks. The power produced by its three 5,000-kw generators will be sold to the Golden Valley Electric Co., an R.E.A. cooperative, and to the Fairbanks Municipal Utilities system.

The proposed dam construction is based on the anticipated requirements of the two utilities for a new source of power by the fall of 1965. The construction schedule calls for two stages to be completed during the 1963 and 1964 construction seasons.

One of the early steps will be the installation of the corrugated-iron diversion tunnel to maintain a flow in the stream during construction and until the reservoir is filled and power production begins. This flow is required for fish in the stream. The culvert will be fitted with control gates to regulate the flow. When the project is complete and the reservoir

for a look at a complete line of...

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Choose from a complete line for on or off highway hauling of extra heavy equipment. Standard units for loads up to 75 tons. Special units for heavier loads. Many financing plans available. For complete information, call the Trailmobile office nearest you or use the coupon.

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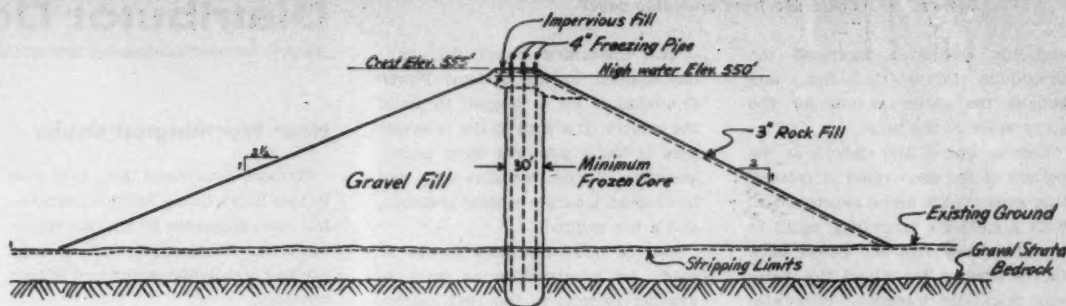
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address \_\_\_\_\_ city \_\_\_\_\_ zone \_\_\_\_\_ state \_\_\_\_\_

For more facts, use coupon or Request Card and circle No. 290

CONTRACTORS AND ENGINEERS



This typical section shows the construction of the dam with the frozen core protected by a blanket of impervious fill at the top. The upstream face will be riprapped with rock, and the downstream face will be planted to native vegetation.



filled, the diversion pipe will be plugged with concrete.

During the first construction season, the contractor will place approximately half of the total yardage of gravel, bringing the upstream portion of the structure to an elevation of about 100 feet above the foundation.

As soon as the core for that portion is frozen, the gates of the diversion pipe will be partially closed so that filling of the reservoir can begin. All possible water will be stored from this time on until the reservoir is filled.

In the second season, the downstream section of the dam will be brought up to the elevation of the upstream section, and the entire structure will then be brought up to finish grade.

A channel, cut into the left abutment, will serve as a spillway if one is ever needed. The channel will be fitted with timber gates. Since the stream has a runoff of some 350,000 acre-feet per year and the reservoir has a capacity of about a million acre-feet, it is improbable that the spillway will ever be used.

#### Penstocks are salvaged siphons

An open channel 30 feet deep around the right end of the dam will lead the water to the forebay, and steel penstocks will deliver it to the turbines. Fitted with stop logs and a trash rack, this channel will permit drawdown of a large part of the reservoir without elaborate outlet works. A log boom in the reservoir will help stop floating ice and debris.

To control the temperature of the water in the stream below for the benefit of fisheries, the power channel will be fitted with a baffle that will permit the water to be drawn off from any elevation in the reservoir.

From the forebay, three penstocks will feed the turbines of each of the three 5,000-kw generators. While this seems unconventional, it makes sense to Hanson, since he has on hand approximately a mile of 46 and 52-inch pipe recovered from another project. This is another story worth telling:

Some years ago, a gold-mining company installed a 42-mile system to deliver water to its hydraulic dredges. The system consisted of water rights, a diversion dam, 38 miles of open channel, and four miles of 46 to 52-inch pipe siphons. It was designed to deliver 125 second-feet of water to the dredges.

When the gold was mined out of the area served by the system, Hanson (Continued on next page)

**so easy  
to handle**

**so easy  
to install**

**so  
long-lasting**

**because**

**it's corrugated galvanized sheet steel**

You don't have to baby a drainage structure made of Beth-Cu-Loy corrugated galvanized steel. Steel won't crack or spall or crumble. You don't always need hoists to lift or move it, either; a 14-ft length of 18-in. pipe made from 16-ga Beth-Cu-Loy weighs but 214 lb. Two men can easily handle that!

With its long lengths and simple field joints, Beth-Cu-Loy drainage pipe can be laid just as fast as the trench can be

dug. No sealing compounds, no curing time with corrugated galvanized steel. And once it's in, a Beth-Cu-Loy structure will last the life of the project. Many steel culverts are still in service after 40 and 50 years.

Beth-Cu-Loy sheets conform in every way to the specs of the AASHTO. Your fabricator will gladly furnish whatever details you'd like to have about Beth-Cu-Loy sheets. Or write direct to us at the address below.



for Strength  
... Economy  
... Versatility

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Export Sales: Bethlehem Steel Export Corporation

**BETHLEHEM STEEL**



For more facts use Request Card and circle No. 291

(Continued from preceding page)

and his associates organized the Chatanika Power Co., Inc., and bought the entire system for the scrap value of the pipe.

Cutting one of the siphons at the bottom of the deep valley it crossed, they converted it into a penstock and built a 5,625-kw generating plant at the site. They now sell power back to the dredges for which the water was originally intended. They also supply power to the Golden Valley Electric Co. at a rate of 10 mills per kwh. This system operates only during the summer because of freezing problems.

With more than a mile of the steel pipe on hand, Hanson worked out the design to use some of it in the job.

The Chatanika Power Co., Inc., has applied to the Federal Power Commission for a license to build the project. The land in the reservoir area is being withheld from homesteading; it now contains only one homestead, a couple of mining claims, and a few cabins.

The \$6 million project should be ready for construction as early as weather permits in the 1963 season. The work is to be financed on a short-term basis, since the construction of the huge Rampart project on the Yukon or other large power developments might make this plant uneconomical in the not too distant future.

THE END

## Distributor Doings

### New Worthington dealer

Barouco Equipment, Inc., 4830 East Brooks Town Drive, Baton Rouge, La., has been appointed by the Worthington Corp., Harrison, N. J., to distribute its construction equipment in that territory.

### Seaman names dealer

The Square Deal Machinery & Supply Co., Inc., has been appointed distributor for eastern Florida by The Seaman Corp., Milwaukee, Wis., and its Seaman-Gunnison Division. The

dealer will handle sales and service of Seaman Duo-Stabilizers, Duo-Factors, Tri-Factors, and vibratory Impactors from offices at Orlando, Jacksonville, and Miami.

### H. O. Penn expands parts sales staff

H. O. Penn Machinery Co., 140th St. and East River, New York 54, N. Y., has expanded its sales force to handle Caterpillar parts, exchange parts, and the firm's Custom Track Service in the rebuilding of tracks and undercarriages.

Joseph F. Schmid takes over sales in the western part of Nassau County and Brooklyn; Charles J. Miller will cover Dutchess, Sullivan, Ulster, Orange, Rockland, and Putnam counties; Theodore Wrobel will handle the New York metropolitan area. Garrett R. Hughes and George Groback will cover Connecticut between them.

### Allis-Chalmers names Missouri distributor

Cooke Sales & Service Co., 1422 Washington St., Chillicothe, Mo., has been appointed Allis-Chalmers engine dealer for 36 counties in that state. The firm, which has branches in St. Joseph, Sedalia, and Fulton, Mo., will sell and service engines and power units, engine-driven electric generating sets, etc.

### Euclid names dealer

Drott Tractor Co., Inc., 3841 W. Wisconsin Ave., Milwaukee, Wis., has been appointed by Euclid Division, General Motors Corp., as its distributor for Wisconsin, excepting Douglas County. Drott will handle the complete Euclid line. The dealer has branches in Madison, Wis., and Iron River, Mich.

### Ellicott appoints Pacific distributor

Ellicott Machine Corp., Baltimore manufacturer of hydraulic dredging equipment, has appointed the George M. Philpott Co., Inc., distributor in Northern California and the Pacific Northwest. Philpott's main office is at East Grand Ave. and Harbor Way, South San Francisco. It has other offices in Oakland, Sacramento, and Fresno, Calif.; and in Portland, Ore., and Spokane, Wash. Its sales territory includes Idaho and Nevada.

### Elmco appointment

The Elmco Corp., Salt Lake City, Utah, has appointed the Horne Equipment Co., Inverness, Minn., exclusive dealer in that state for Elmco's line of crawler tractors and loaders.

The rate of motor-fuel consumption in the United States for 1961 is expected to be 781 gallons per vehicle. Total for the nation is 64.9 billion gallons, 2.6 per cent over 1960.

CONTRACTORS AND ENGINEERS



Here two Victorpacs, turntable mounted on traveling platform, supply dual wire feeders on Victor TLM-2 automatic track link rebuilder.

# NEW VICTORPAC

## Reduces track rebuilding costs 2 ways

**Saves you 3¢ per pound and up to 2 hours changing coils**

Now you can get Victor high quality, uniformity guaranteed VA4X, VA5X, and VA7X continuous-coil hardfacing wire in 500-lb. Victorpac containers. You pay 3¢ less per pound than for standard 100-lb. layer wound rolls. You also eliminate four coil changes and gain up to 2 hours productive time per 500-lb. Victorpac. Also available, 200-lb. Victorpac at savings of 2¢ per lb.

**Works with all automatic rebuilders**

Simple, low-cost turntable enables you to use Victorpac hardfacing wire with track link rebuilders, roller and idler rebuilders, grouser bar welders, or any other automatic welder. Victorpacs are easy to handle and store, keep wire clean and dry.

Why not take the easy Victorpac way to increased productivity and lower wire costs? Order from your Victor dealer now. He's your one-stop source for hardfacing wire, rebuilding equipment, welding apparatus.



Profitable dealerships open; inquire now!

**VICTOR EQUIPMENT COMPANY**

Alloy Rod & Metal Division  
13808 E. Imperial Highway, Norwalk, California  
Wakita, Oklahoma

For more facts use Request Card and circle No. 292

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## ***Maintenance Dept.***

# **Johnson Bros.' race against downtime**

**Y**ou might compare Johnson Bros.' preventive-maintenance program to a relay race: everyone from the president on down to the equipment operator has his stretch to run in this race with downtime.

Equipment superintendent Bill Schaefer reverses the order but says the same thing: "Preventive maintenance starts with the operator and goes right on up to the president. Everybody in our outfit realizes the importance of taking proper care of equipment."

Bill's outfit, Johnson Bros. Highway & Heavy Constructors, Inc., of Minneapolis, does an impressive annual volume of work that requires a lot of machinery. A tightly run preventive-maintenance program that spreads responsibility throughout the firm and makes use of concise maintenance records keeps downtime out of the running and adds \$\$ to the profit side of the ledger.

At Johnson Bros., operators are instructed in the proper care of their rigs at informal training sessions. In addition, there are



## 34



# Maintenance Dept.

(Continued from preceding page)

noon break or after working hours, but when necessary the rigs are pulled off the line to be serviced.

Lubrication equipment is simple but effective. The various oil and grease drums are mounted on the flat bed of a Ford 2½-ton truck. Manpower, rather than air pressure, gets the grease and oil from drum to fitting. To facilitate tipping and pouring, the drums are mounted in hinged brackets. Men use hand guns to apply the grease. The men claim hand guns are faster than pressure guns since they are not limited by a length of hose. The oilers keep a half-dozen guns loaded, ready for use.

Also mounted on the open bed of the lube rig are two large steel cabinets for storage of filters, tools, and other small items. A portable light plant completes the rig's equipment.

Mechanics ride the job in a 2½-ton truck. At the rear of the flat bed is an A-frame boom with a 1-ton chain hoist. Mounted on either side of the flat bed are large steel tool cabinets. The rig is also equipped with an air compressor, a light plant, and a welding torch. The mechanic keeps in touch with the superintendent, foremen, and a second mechanic's truck by means of a Motorola 2-way radio.

## Complete record system

Normally, no maintenance shop is set up at the job site. Many of the spare parts necessary for repairs, however, can be obtained from two parts vans in the field-office area.

Johnson Bros. keeps complete records of fuel and oil consumption. The lube man fills out a daily report that records the oil and fuel quantities for each rig. In addition, the report lists



A mechanic's Ford 2½-ton truck is equipped with a boom and 1-ton chain hoist. It also carries tool cabinets, a welder, air compressor, and light plant.

oil filter, transmission grease, final grease, master clutch, steering clutch, starting engine, hydraulic oil, differential grease, generator starter, steering gear, and air cleaner.

Whenever a rig is down for more than 15 minutes or requires a spare part, the mechanic must fill out an equipment work order. This report tells the nature of the repair and the materials and labor necessary to make it. It is made out in duplicate on 8 x 11-inch form sheets, with one copy going to the field office and the other to the accounting department in the home office. The accounting department figures out exactly what the repair costs the company, and includes this information on the report form. The cost is transferred to a ledger along with the identifying equipment number. The equipment work order goes on file as a permanent record.

The equipment's downtime is also recorded on the equipment work order. The total of downtime hours is compared with total operating time.

Johnson Bros.' grading spread is currently on an 11-mile stretch of

Interstate Highway 35 near Pine City, Minn. The highway will eventually connect Minneapolis and Duluth. The contract includes about 2 million yards of excavation, as well as the construction of eight bridges.

On this job there is a lot of equipment to keep running. Eighteen scrapers—mostly Cat DW20's and 21's—handle the bulk of the earthmoving. A total of five American and Bucyrus-Erie draglines dig into the peat bogs in the right-of-way.

A 10-inch cutterhead dredge, not usually found in this type of work, assists with the muck excavation. The dredge works two sections adjoining a river that crosses the highway. Johnson Bros. subcontracted the dredging.

Most of the fueling, greasing, and oiling is done during break time, but sometimes it is necessary to pull equipment off the line. One lube truck and two mechanic's trucks service the equipment. A head mechanic supervises the work of three oilers, two welders, and seven mechanics.

THE END

## Hints for keeping crawlers at peak winter performance

The crawler tractor—basic machine in the contractor's inventory of equipment—has become even more important in wintry regions where poor traction sidelines other types of equipment. And though its design already makes it an ideal construction tool for winter use, the crawler requires careful servicing and maintenance for peak performance.

International Harvester's Construction Equipment Division offers the

**"THIS LUBRICANT KEPT 'EM ROLLING IN MUD, MUCK AND WATER"**

—says J. O. ARCHIBALD  
of Redwood City, California

The job was clearing 500 acres of salt marsh for crystallizing ponds. To quote, "We selected LUBRIPLATE No. 107 for track and general lubrication and LUBRIPLATE AFG-140 for transmissions and final drives. During the entire job there was no replacements of track rollers nor any tie-ups of equipment due to parts replacement or breakage!"

**REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.**

LUBRIPLATE is available in grease and fluid densities for every purpose... LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.



For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK"—a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.



For more facts, circle No. 297

## 272 JACKS & PULLERS / SIMPLEX

to choose from! THE WORLD'S MOST COMPLETE LINE

### 81 Hydraulic Jacks & Pullers



**STANDARD HYDRAULIC JACKS**  
11 Models  
1½ to 100 tons capacity  
5¼" to 22" travel



**"JENNY" CENTER-HOLE HYDRAULIC PULLERS**  
5 Models  
30 to 100 tons capacity  
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**"RE-MO-TROL" PULLERS** Solid and Center-Hole Rams  
39 Models  
10 to 300 tons capacity

### 45 Lever Jacks

Also Pole-Pulling, Reel, Timber, Cable & Wire Tensioning, Pipe Pushing & Pulling, Tie Remover, Tie Replacer, and Siding & Flooring Jacks.



**SINGLE ACTING RATCHET LOWERING**  
11 Models, 5 to 20 tons capacity.  
Full capacity on toe or cap.



**GEARED JACKS**  
3 Models, 25 to 35 tons capacity.  
Side toe lift.



**TRACK (TRIP) JACKS**  
13 Models (Five aluminum alloy)  
Single and double acting.

### 146 Screw Jacks



**SCREW JACKS 4-WAY HEAD—19 MODELS**  
10 to 24 tons capacity.  
Ball bearing, Malleable Housing, Safety peep hole.



**JOURNAL JACKS 8 MODELS**  
15 to 50 tons capacity.  
Powerful, light, low height.

**TRENCH & TIMBER BRACES**  
22 Models. Drop-forged steel—1½" & 2" dia. screws. Adapt to any width of trench.



Other screws types. Ratchet Head Planer and Reel Jacks; Push-Pull and Shoring Jacks; Steamboat Ratchets & Load Binders; Mine Roof and Timber Jacks, Rail Puller & Expander, and Gear & Wheel Pullers, Bumper Jacks.

For Complete information write for: Mechanical Jacks / Hydraulic Jacks Catalog

TEMPLETON, KENLY & CO.  
11 GARDNER ROAD  
BROADVIEW, ILLINOIS

For more facts use Request Card and circle No. 296

# Maintenance Dept.

following guides to winter maintenance of your crawlers.

Proper operation begins with proper starting, of course. Quick diesel starts depend on good compression through sound ring and valve performance. The injection system must be timed to deliver fuel at just the right instant through nozzles, or injectors,

that spray fuel accurately with no dribbling.

The ignition system must be correctly adjusted and in good shape. Worn wiring and poor connections set up a terrific resistance during low temperatures. Battery condition is probably the most important single factor in the starting picture. A full

charge must be maintained at all times.

The quickest way to bring batteries back to life is to submerge them in warm water to within 2 inches of the top plates. Check battery levels every week.

All gaskets, especially at the cylinder head and manifolds, must be

in good condition. Check all hose connections to prevent leakage of antifreeze.

Most equipment owners find it advantageous to premix their antifreeze solution in large quantities. Then, when make-up coolant is needed, there is no guesswork required as to the strength of the mixture and no wasteful overuse of antifreeze "just to be on the safe side."

## Lubrication

If temperatures in your area dip below 10 degrees, SAE 10W crankcase oil and SAE 80 multipurpose gear lube will do the job. From 10 to 25 degrees below, dilute 10W lube oil with about 10 per cent kerosene and use sub-zero gear lube MIL-L-10324. Since lube oils have a tendency to thicken in use, it's a wise move to add one quart of extra kerosene to the crankcase each week.

Where temperatures sink under 25 degrees below, crankcase oil that meets Military Specification MIL-O-10295 is specified. MIL-L-10324 gear lubricant is still satisfactory. Your oil supplier or construction-machinery distributor can furnish information on brands of lubricants that meet these specifications.

Use the same weight oil in the air cleaner as is used in the crankcase. Heavy oils often act as a choke and cause hard starting. Although winter operation is generally not dusty, don't neglect recommended crankcase, filter, and lubrication servicing requirements. There is a chance that condensation will form in the fuel tank and crankcase, and that moisture will damage other lubricated parts. Service the fuel-line water trap daily. If it becomes overfull, the water could freeze and break the glass container.

## Operating tips

With a gasoline starting system, use fresh, winter-grade gasoline. Protect it in sealed containers. Don't forget to operate the engine on the gasoline cycle before shutting the engine down. This insures dry, clean spark plugs when it's time for the next start. And always leave the engine with the change-over lever in the diesel position. This allows the starting valves to cool evenly on their seats.

When using a direct-start ether injector, operate the engine with the primer in the "injection" position only long enough to provide a successful start, with the engine running smoothly. Four minutes is the maximum time needed to inject ether in even the lowest temperatures.

The most critical period of cold-weather operation is when the unit is first put to work in the morning. Care should be taken in warming up the tractor. Not only the engine but the whole tractor should be moved and warmed up gradually to get all parts well lubricated before putting them under heavy load. THE END

CONTRACTORS AND ENGINEERS



## meet today's most advanced 3/4 yard machine

... it offers you \$6,590 worth of profit-producing features as standard

This P&H will help you dig more profitably... offers you unmatched speed and economy of operation.

One of the reasons: Independent Propel and Automatic Propel Brakes—costing at least \$1700 extra on other makes. How does this effect production? By letting your operator travel or "move up" at the same time he swings, dumps or goes through his other work motions. It means he's always in position without stopping his production digging. And the seconds he saves on each move-up mean many minutes and a lot more yardage at the end of the day. P&H Propel Brakes release automatically as soon as the machine is ready to travel... automatically go "on" as soon as the propel motion stops.

Take a look at the other P&H bonus extras in this powerful "315"—

- True, tractor-type crawlers give you smoother, easier travel over any terrain. Tractor type shoes, rails and side frames give better traction, greater maneuverability and longer crawler life.

- 4-speed transmission means a wider operating range. Lets you match the correct line speed and pull to your specific working operations for greater efficiency.

- Planetary Power Boom lets you raise or lower boom under power, independently of other work motions. Means more positive control for accurate positioning of the work load.

- Power Box design keeps all vital gearing completely sealed from dirt and grime... running in an oil bath for continuous lubrication. Requires only one oil change per year. Means longer life and far less maintenance.

And with the Model 315, you get Swing Brakes, Live Roller Circle and Positive-action Hydraulic Controls, too. All of these "bonus-extras," offered as standard, add up to \$6,590—make this 3/4 yard P&H rig the greatest performer in the field.

We invite you to make your own comparison. Climb aboard and put it through its paces—you be the judge.

Get in touch with your local P&H dealer for the complete story. Call him today. For new literature X-342 mail coupon.

**HARNISCHFEGER** **P&H**

Milwaukee 46, Wisconsin

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Please send me the new literature and specification sheets on Model 315 P&H crawler with complete attachments for HOE, SHOVEL, DRAGLINE, CRANE AND CLAMSHELL.

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For more facts, use coupon or Request Card and circle No. 298



# Product Parade

For further information on the products described in this section, circle the designated number on the Request Card.

## Off-highway truck holds 42 yards

LeTourneau-Westinghouse announces a new Haulpak truck model with a capacity of 65 tons.

Known as Model 65, the unit holds 42 cubic yards, struck. Four big pistons that act like giant shock absorbers are used instead of conventional springs and axles. The truck is said to be easy and safe to handle, with full power steering and power brakes.

The 160-inch wheelbase makes the Haulpak 65 exceptionally maneuverable, and the turning circle on the front wheel track is only 55 feet.

LeTourneau-Westinghouse Co., Dept. C&E, 2301 N. E. Adams St., Peoria, Ill. Circle No. 104 on Request Card.



## Ripper unit offered for crawler tractors

Designed specifically for Caterpillar D6 serial 14A and 15A tractors, the new Ateco HR-D8d/29 ripper provides ample clearance for Cat rear-mounted No. 29 or 25 cable control winches.

The new unit will accommodate up to 3 straight or curved shanks. Maximum ripping depth is 24 inches for standard shanks, or 42 and 48 inches with special straight shank, according to the manufacturer.

Among the many new and improved features are steel swing brackets designed for added strength and ample tool-beam clearance (14 inches with ripper lowered), a stronger offset boxed tool beam of 1½-inch plate internally reinforced, and fender-mounted pump, tank, and valve assembly.

American Tractor Equipment Corp., Dept. C&E, 9131 San Leandro Blvd., Oakland, Calif. Circle No. 103 on Request Card.

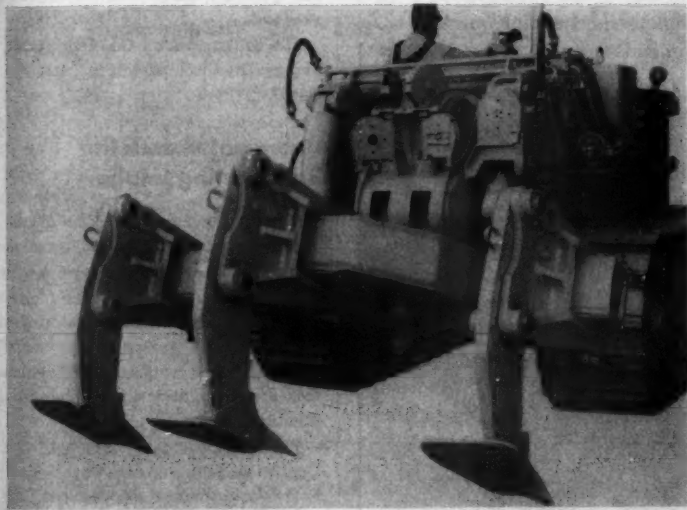
## New loader features capacity of 6½ tons

The Model 250D tractor shovel is available from the N. P. Nelson Iron Works, Inc.

This new unit features a 13,000-pound lift capacity. A special bucket permits a maximum dumping angle of 60 degrees. Full power-shift transmission, planetary axles, power steering, power brakes, and full-vision underslung-type safety arms are standard.

With this machine, Nelson now offers three sizes of tractor shovels with bucket capacities ranging from 1½ to 4 cubic yards.

N. P. Nelson Iron Works, Inc., Dept. C&E, 850 Bloomfield Ave., Clifton, N. J. Circle No. 6 on Request Card.





The Bucyrus-Erie H-5 wagon-mounted crane features a 22-foot turning radius. Rear-wheel, hydraulic steering provides extra maneuverability.

### Wagon-mounted crane for tight yard work

The Model H-5 wagon-mounted crane for close-quarter yard work has been developed by the Bucyrus-Erie Co. The self-propelled wagon is designed exclusively for the firm's H-5 Hydrocrane, a 12-ton  $\frac{1}{2}$ -yard crane excavator.

Rear-wheel, hydraulic steering provides extra maneuverability. The new machine's turning radius is 22 feet. It has a 110-inch wheelbase, an over-all length of 35 feet with the standard 2-piece boom in a retracted position, and a 9-foot width with outriggers retracted. All controls are at the operator's station in the cab.

Outrigger housings are built right into the wagon's body, giving the unit a very low center of gravity for better stability and overhead clearance. Manual, independent pivot lockouts on the steering axle check leaning and sway and also add stability for over-the-side lifts.

The new machine is driven by a Ford 6-cylinder gasoline engine and features a Ford Cruise-O-Matic transmission with three speeds forward and one in reverse.

Bucyrus-Erie Co., Dept. C&E, South Milwaukee, Wis. Circle No. 24 on Request Card.

For lugging power unlimited...

HELTZEL

specifies

DIAMOND  
roller chain

Exposed to weather and abrasive grit...

Subjected to quick starts under heavy loads...

With no special care or protection...

DIAMOND Roller Chain drives the 60-foot aggregate conveyors on Self-Erect Mobile Batching Plants manufactured by Heltzel Steel Form and Iron Company. To meet urgent construction schedules, the conveyors often operate 'round the clock handling concrete aggregates at rates up to 10 tons every 60 seconds. It's a rugged operation... typical of the tough, demanding jobs handled easily and economically by DIAMOND Roller Chain.

Contact Diamond Chain Company, Inc. for complete specifications and usage recommendations.

**DIAMOND CHAIN COMPANY, INC.**

A Subsidiary of American Steel Foundries  
Dept. 487 • 402 Kentucky Ave. • Indianapolis 7, Ind.  
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HELTZEL Self-Erect Mobile Batching Plants can be set-up, ready to run in approximately 2 hours. Standard models offer batching capacities from 65 to 230 cubic yards per hour. All models feature DIAMOND Roller Chain for reliable, low-cost power transmission.

### Offer nine new buckets for wheel-type loaders

Nine new general-application buckets are now available for Caterpillar wheel-type loaders.

Designed to match capacities to materials, these buckets incorporate new extended cutting edges. Induction-hardened, the edges are self-sharpening to retain good penetration throughout their service life.

Cast-steel corner pieces are welded both to the cutting edge and to the bucket. These hardened corner pieces provide maximum strength to withstand heavy stresses that are concentrated on the corner of a bucket at work.

Holes for mounting bucket-teeth adapters are predrilled in buckets of the types normally used for excavation work.

Caterpillar Tractor Co., Dept. C&E, Peoria, Ill. Circle No. 19 on Request Card.

### Universal theodolite has erecting image

An erecting-image telescope model of the standard Wild T-2 universal theodolite is available in the Model T-2E.

The new model incorporates all the features of this 1-second instrument for triangulation and precise angular measurements, according to the manufacturer.

Wild Heerbrugg Instruments, Inc., Dept. C&E, Main and Covert Sts., Port Washington, N. Y. Circle No. 20 on Request Card.





## Hydraulic truck crane has more versatility

Featuring greater lift capacity and increased versatility over previous models, the new Hlab Model 193 hydraulic truck crane is available from Stanco Mfgs. & Sales, Inc.

According to Stanco, the Model 193 is particularly adaptable for smaller construction crane duties formerly assigned to larger units.

Easily installed behind the cab of any truck or tractor, the fully hydraulic machine can be operated by one man in lifting and placement of culvert pipe, machinery, oil drums, and other heavy or cumbersome loads. The Model 193 takes up only 12 inches of space between cab and bed, the company states.

The unit's hydraulically powered, cable-operated boom permits vertical lifting and boom swing. Dual controls at the rear of the cab allow the operator to have full view and control of the load at all times.

Lift capacity at 6-foot boom length is 3,000 pounds double line, 2,200 pounds single line. With the boom at full 11½-foot extension, lift capacity is 1,200 pounds. Boom swing is a full 190 degrees, with a working range of 21 feet above ground to 18 feet below ground.

A variety of attachments for specialized jobs is available.

Stanco Mfgs. & Sales, Inc., Dept. C&E, 1666 Ninth St., Santa Monica, Calif. Circle No. 38 on Request Card.

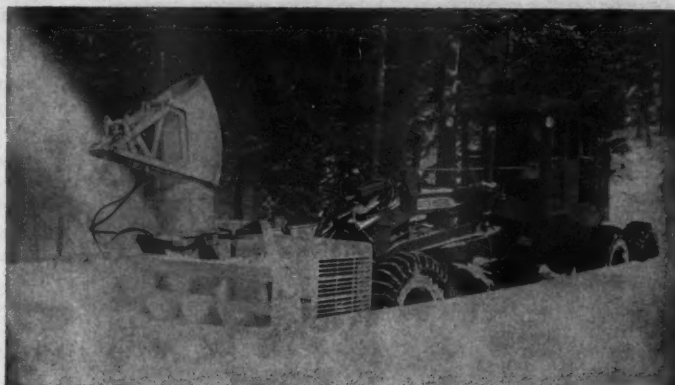
## Submersible pump drains down to surface level

A portable, submersible, self-priming centrifugal pump, which drains flooded areas down to surface level through a new vacuum-action drainer base, is available from the Haynes Equipment Co.

Known as Demon Drainer, the pump weighs 23 pounds. All electrical connections are completely water-proofed, and the pump is 3-wire grounded with a 12-foot cable. Its Kenco 110-volt 60-cycle single-phase sealed motor cannot foul or corrode, according to the manufacturer, and is thermal-overload protected.

The Demon Drainer is constructed of sturdy aluminum and has a 1-inch hose outlet. It delivers 1,000 gph at a 15-foot head.

Haynes Equipment Co., Dept. C&E, 62 Voorhis Lane, Hackensack, N. J. Circle No. 5 on Request Card.



Capable of moving 20 to 25 tons of snow per minute, this new Sicard rotary-type snowplow attachment can be mounted on Austin-Western graders and put into use within 30 minutes.

The unit operates successfully at elevations as high as 12,000 feet, and in snow as deep as 5 feet. It can cast snow as far as 175 feet. Austin-Western Division, Baldwin-Lima-Hamilton Corp., Dept. C&E, 601 N. Farnsworth Ave., Aurora, Ill. Circle No. 62 on Request Card.

popular  
*Stoody 105*  
available  
as *Manual*  
*Electrode...*

# STOODY 1105

For the company maintenance shop desiring to rebuild its own heavy machinery undercarriage parts, but not having sufficient rolling stock to warrant the installation of automatic welding equipment... *here is the ideal electrode.* Providing the same deposit properties as the widely used Stoody 105 automatic hard surfacing wire, Stoody 1105 may be used for hard-facing tractor rollers and idlers, arch wheels, shovel rollers and idlers, charging car wheels and sprockets, as well as churn drills and other equipment subject to severe impact and abrasion and metal-to-metal wear.

Literature describing *STOODY 1105* is available. See your nearest *STOODY DISTRIBUTOR* (check the "Yellow Pages" in your phone book) or write direct.



**STOODY COMPANY**  
11904 E. Slauson Avenue • Whittier, California

For more facts use Request Card and circle No. 300



The George E. Failing Model MO-1 auger drill is rated to drill 5-inch holes to a depth of 100 feet.

### New machine announced in auger-drill line

A new auger drill, the Model MO-1, is announced by the George E. Failing Co., a subsidiary of the Westinghouse Air Brake Co.

The rig is designed for foundation sampling and testing, highway road-bed testing, bridge and dam construction, auger drilling, and coring. It is an efficient unit for drilling "blind holes" where there is no return of cuttings either by air or fluid circulation, states the manufacturer.

Basic features of the rig include a traveling head mechanically driven, a chuck for conventional rotary drilling, and a hydraulic pull-down. A circulating pump may be mounted on the drill if desired. The unit is designed for one-man operation.

The MO-1 rig has a stationary mast and provides a 5½-foot stroke for use with 5-foot augers. It is rated to drill 5-inch holes to 100 feet. Over-all height is 10 feet 4½ inches.

George E. Failing Co., a subsidiary of Westinghouse Air Brake Co., Dept. C&E, Enid, Okla. Circle No. 56 on Request Card.

### All-weather level rod has durable graduations

A face with graduations that reportedly won't wear off or discolor is one of the features of a new, all-aluminum, all-weather level rod—the Model 462M—offered by the A. Lietz Co.

The body of the rod consists of four sections of formed aluminum tubing that are easily assembled with precision-fitted 3-prong joints. Sections lock firmly together by means of spring-loaded clamps. The construction makes it impervious to rain or submersion even in salt water, according to the manufacturer.

The No. 462M is fitted with two folding handles that clamp at right angles to the rod with a slight turn. There is also a built-in, recessed level for keeping the rod plumb. Total length of the assembled rod is 14 feet.

The A. Lietz Co., Dept. C&E, 840 Post St., San Francisco 9, Calif. Circle No. 34 on Request Card that is bound into this issue.

### New elevator announced for material handling

A completely redesigned material-handling elevator for construction work is announced by the American Tubular Elevator Division of the Universal Mfg. Corp.

Simplified erection, versatility, savings in erection time, and safety are said to be key features of the new elevator, designated the Type HT panel tower, which may be used as a single or double unit.

Concrete handling is simplified through the redesign of the concrete equipment, both bucket and hopper, which are completely inside the tower. By the use of pivoting arms

attached to the bucket mount, the hopper can be positioned at any level under power from the hoist in a matter of minutes. And, since both wells are the same size, the concrete equipment can be used in either well.

A new-type boom, with a capacity of 2,000 pounds, has been developed for the panel tower. It is mounted in the center of the tower opposite the hoist and the hoist operator for greater safety and coverage.

Universal Mfg. Co., American Tubular Elevator Division, Dept. C&E, Zelienople, Pa. Circle No. 40 on Request Card.

## "Our 48 Ford Trucks have given maximum economy in every way!"

says Fred Newkirk, Manager of Materials Transportation Company, Inc., Corpus Christi, Tex.

"We are using Ford Trucks exclusively because they provide important savings—starting with a lower initial expenditure. We estimate that each Ford costs us about \$1,500 less than other makes of comparable size and capacity. Our maintenance and repair costs are less, too. The greater parts interchangeability on Ford Trucks makes it possible to reduce our parts inventory by about 50%; this frees \$2,500 of working capital. And in operating expenses, we save on gasoline because our Fords deliver an extra ½ mile per gallon.

"They have proven more durable, too. For example, our 1958 Ford F-1000 has logged over

160,000 miles without even having the head pan off. We expect 200,000 miles from our Super Duties before a major overhaul. Some of our 1955 and 1956 Ford F-900's still have original brake linings after 300,000 miles.

"Our trucks operate six days a week, and average fleet mileage is 51,000 miles per year. We haul 48,000-lb. payloads of bulk cement, 37,760-lb. payloads of sack cement for Halliburton Portland Cement Company. Our drivers are very enthusiastic about these new Ford Super Duties. They report that with 72,000-lb. gross vehicle weights, the Fords are smooth riding and easy to handle."

Solid testimony that Ford's full-time economy only starts with low

## FORD TRUCKS COST LESS

PRODUCTS OF  MOTOR COMPANY





### Short-shaft vibrators for prestress work

Six new air and electric-powered concrete vibrators designed with short shafts for maximum convenience in prestressed and pre-formed work are announced by the Remington Arms Co., Inc.

Designated Series EVH, all models are equipped with  $1\frac{1}{4} \times 12$ -inch hardened steel heads giving high kick vibration, and are made to fit more easily between reinforcing bars, into thin cross-sections, and in other forms where large-diameter heads cannot be used. Easy one-man portability and operation due to the 4 and 7-foot shaft lengths of the new models are other benefits, according to the manufacturer.

Remington Arms Co., Inc., Dept. C&E, 939 Barnum Ave., Bridgeport, Conn., Circle No. 63 on Request Card.

### Two spreaders feature hydraulic cab control

Fast-acting, hydraulic cab control of all components is featured on two new spreaders announced by the Swenson Spreader & Mfg. Co.

A movable, cab-controlled chute on both models—replaceable tail-gate type and V-box type—drops the material onto the spinner in the position necessary to change the spread from left, to center, or to the right of the truck. Spinner, augers, and truck speed operate independently of each other to apply materials in wide or narrow swaths, from 2 to 45 feet, and in heavy or light applications, as desired.

"Shuffling augers" operate in opposite directions to chew up any caked material, thus eliminating "bridging" or packing. Hydraulic flow-control valves adjust the auger speed for different types of aggregate.

An adjustable metering gate allows precise control when spreading minute amounts of material. Any combination of sand, gravel, salt, chemical, or cinders can be applied.

Swenson Spreader & Mfg. Co., Dept. C&E, Lindenwood, Ill. Circle No. 39 on Request Card.

### Extruding machine for concrete planks

An efficient new method of prestressing and forming concrete roof, floor, and wall slabs is announced by the Spancrete Machinery Corp.

Heart of the system is a gantry-mounted extruding machine, which continuously forms 40-inch-wide hollow-core concrete slabs in 4, 6, 8, and 10-inch thicknesses, at a rate of 4 fpm. The machine itself requires a 2-man crew. Only three other men—gantry operator, batch man, and hopper man—are required to produce up to 5,000 square feet of plank per shift, according to the manufacturer.

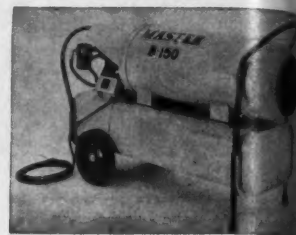
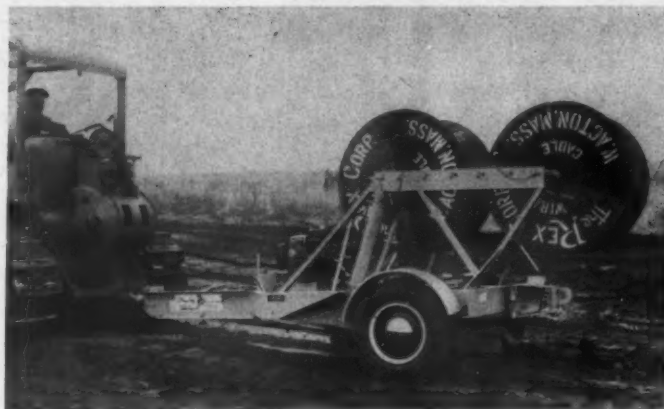
Spancrete Machinery Corp., division of Concrete Products, Inc., 8704 W. Schlinger Ave., Milwaukee, Wis. Circle No. 37 on Request Card that is bound into this issue.

new snowplow attachments are available for Gradalls. Besides the V-plow shown, a one-way snowplow is offered to push the snow to side of the roadway. Warner & Co., Dept. C&E, 5701 Carnegie Way Co., Cleveland, Ohio. Circle No. 125 on Request Card.



For more facts use Request Card and circle No. 301

This cable layer and reel trailer is the new Ryan Model D. Weighing 1½ tons and measuring 7 feet wide and 12 feet long, the unit is designed to handle large reels and three different sizes and types of blades, up to 36-inch depth and up to 1¼-inch cable tube opening. F. B. Ryan Mfg. Co., Inc., Dept. C&E, Chariton, Iowa. Circle No. 60 on Request Card.



#### Portable space heater delivers 150,000 Btu

The new Model B-150 portable space heater offered by the Master Vibrator Co. delivers 150,000 Btu of circulating warm air per hour.

The unit, which can be used indoors or outdoors, can be lifted or wheeled easily by one man wherever it is needed. Any 115-volt ac outlet supplies the power.

Featured as optional equipment is the automatic thermostat control, which automatically turns on the heater and ignites the fuel when the temperature drops and turns off the heater when the desired temperature is reached.

Master Vibrator Co., Dept. C&E, 1752 Stanley Ave., Dayton 1, Ohio. Circle No. 99 on Request Card.

#### Quick-adjusting ripper with one-piece point

A new quick-adjusting cam-lock ripper with one-piece ripper point is offered by the H & L Tooth Co.

With this cam assembly and using only one H & L shank and point, the operator reportedly can achieve four ripping angles with ease and speed.

According to the manufacturer, the ripper point is specially designed to withstand heavy impact and severe abrasion, and to stay razor-sharp throughout long life.

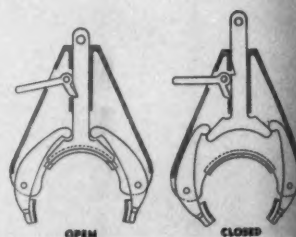
H & L Tooth Co., Dept. C&E, 1540 S. Greenwood Ave., Montebello, Calif. Circle No. 23 on Request Card.

#### Automatic-release tongs for pipeline projects

Automatic-release pipe tongs are available from the C. A. Mathey Machine Works, Inc.

According to the manufacturer, the pipe is released automatically when weight is slacked off. The tongs are available in a complete range of standard pipe sizes from 3 to 36 inches.

C. A. Mathey Machine Works, Inc., Dept. C&E, P. O. Box 1159, 212 E. Frankfort, Tulsa, Okla. Circle No. 17 on Request Card.



CONTRACTORS AND ENGINEERS

## On these two dams, 4 AMERICAN revolvers handle bulk of 1,350,000-yd. pour

The Keystone and Eufaula Dams, both near Tulsa, Oklahoma, have been the subject of many interesting comparisons. Although the dams are similar in size and design, local conditions required completely different techniques in producing, hauling, and placing concrete. Different, that is, with one exception: In both cases, AMERICAN revolver cranes were chosen to handle the major share of concrete placement.

It's another example of AMERICAN's popularity on major construction projects throughout the world. Revolvers to 400 tons. Derricks to 800 tons. And today's most completely modern line of cranes and excavators... sizes 12½ to 110 tons; ½ to 4½ yards. R-408



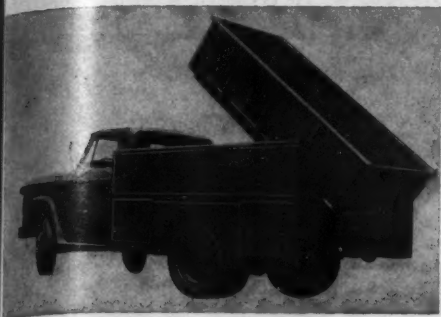
▲ KEYSTONE DAM

▼ EUFAULA DAM



For more facts use Request Card and circle No. 302





The utility body of the new Morysville unit remains stationary when the dump body—with approximately 3½-yard capacity—tilts.

#### Offer combination utility-dump body

A truck body that combines the features of a general utility body with those of a heavy-duty dump body is available from the Morysville Body Works, Inc.

The utility body has weatherproof compartments with adjustable shelves and trays for carrying equipment and tools needed for installations, repairs, and service calls.

When the dump body tilts, the utility body remains stationary. The dump body has approximately a 3½-yard capacity.

This double-duty body is available to fit ¾-ton up to 2-ton chassis.

Morysville Body Works, Inc., Dept. C&E, Boyertown, Pa. Circle No. 100 on Request Card that is bound into this issue.

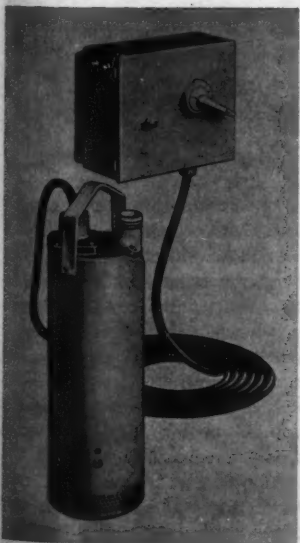
#### Electric drainer pump is rated at 180 gpm

A new compact electric drainer pump, weighing only 93 pounds, has been announced by Sumo Pumps, Inc. With a 2-inch discharge, an outside diameter of 7½ inches, and a height of 26 inches, the new Model 2D combines ruggedness with easy portability.

Used for heavy-duty "dirty water" pumping, the Model 2D reportedly will handle both fresh and salt water containing up to 20 per cent solids.

Maximum capacity of the unit is 180 gpm.

Sumo Pumps, Inc., 23 Brown House Road, Stamford, Conn. Circle No. 11 on Request Card.



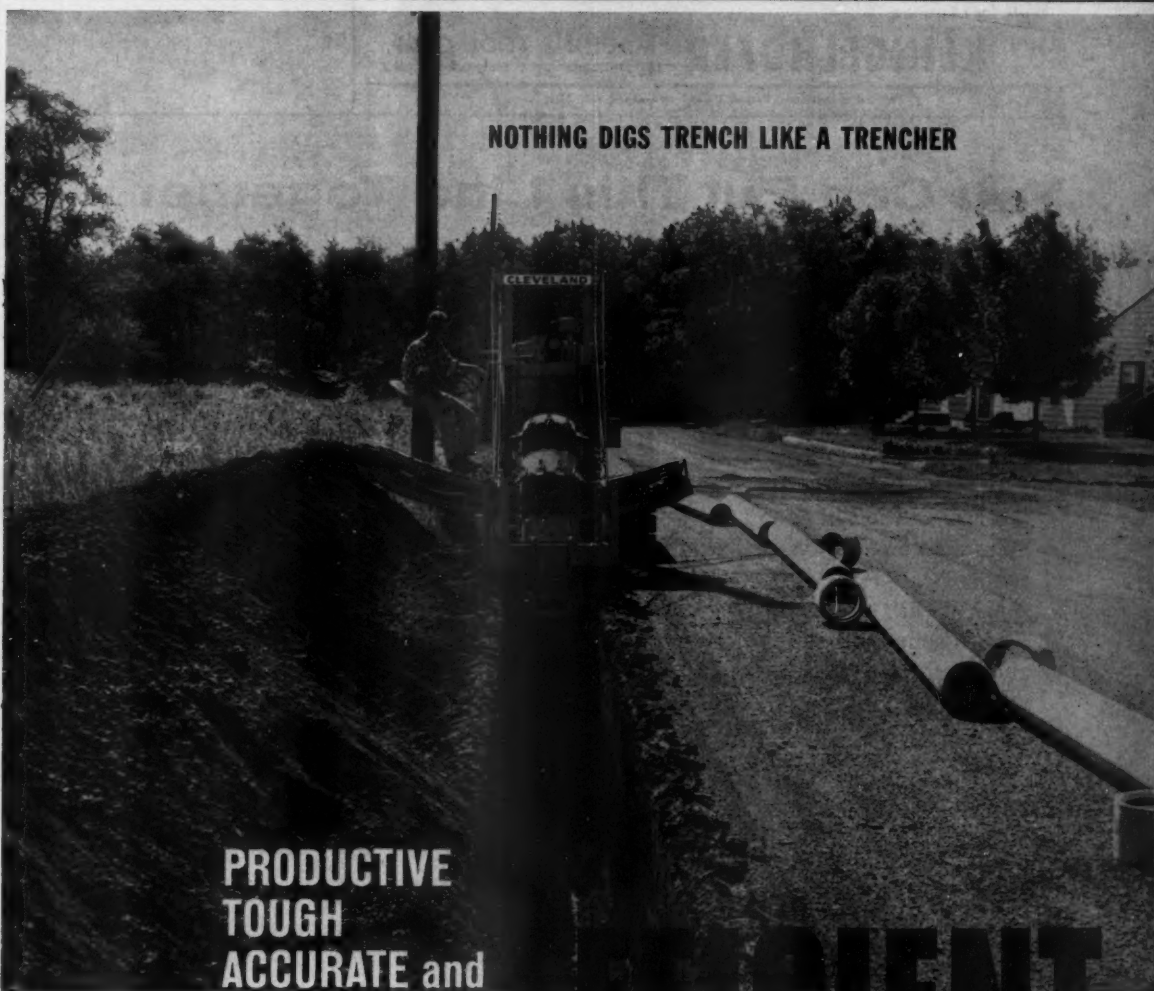
#### PRIME-MOVER

#### POWER TO PRODUCE

Thousands of M-158 Prime-Movers are in use tripling construction laborers' production. Places 12 to 17 cu. yds. of concrete per hour without extensive preparation. Runs on the same type ramps, hoists and runways as hand carts. 10 cu. ft. bucket and flatbed, interchangeable. Write for proof of production performance. Prime-Mover Co., Muscatine, Iowa.



For more facts use Request Card and circle No. 304



NOTHING DIGS TRENCH LIKE A TRENCHER

PRODUCTIVE  
TOUGH  
ACCURATE and

EFFICIENT

No other type of excavating machine approaches the modern wheel-type trencher in trench digging efficiency. This Cleveland Model 110, for example, dug 500% more trench per day than the other-type excavator it replaced on the 11,000-foot utilities job shown above.

No excavating machine but the trencher is designed especially for trench digging. No other excavating machine compares in trenching productivity with a modern, full-crawler-mounted digging wheel.

No other excavator cuts trench to such accuracy of line, width and grade. The trencher's accuracy saves extra dirt handling, saves on repaving costs,

saves on surplus backfill material. Only Cleveland-type trenchers fine the spoil and place it neatly alongside the trench for fast, simple backfill and better, more complete compaction.

Clevelands dig better trenches, in more kinds of soils, in more terrains, than other-type excavators. They dig more efficiently on trench work of all kinds, on all sizes of trench from 8 inches to 52 inches wide. They dig down to 8 feet 10 inches deep and slope trench up to 12 feet wide across the top.

Investigate now the profit potential of a modern trencher—an efficient, fast, dependable Cleveland Trencher.

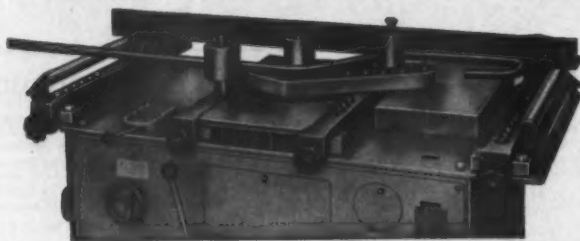


**CLEVELAND  
TRENCHER**

THE CLEVELAND TRENCHER CO., 20100 ST. CLAIR AVE., CLEVELAND 17, OHIO

For more facts use Request Card and circle No. 303

## THE "PERFECT" AUTOMATIC RE-BAR BENDER



**INCREASE PRODUCTION  
BY DOUBLE BENDING**

FEATURING VARIABLE SPEED DRIVE, AUTOMATIC STOP AND RETURN CONTROL,  
COMPLETELY ENCLOSED DRIVE, RADIUS  
AND SPIRAL BENDING ATTACHMENTS.



Write for Literature

**ALBERT KLINGELHOFER MACHINE TOOL CORP.**  
167 Mill Lane Mountainside, N.J.

For more facts use Request Card and circle No. 305

Available in four sizes with  
capacities up to #18s (2½")

ALSO THE NEW HIGH-SPEED "BIFAX" CAPACITY  
UP TO #8 (1"). IDEAL FOR HOOK, RADIUS AND  
STIRRUP BENDING.

Product Parade—Equipment and Material Information That Can Save You Money

The Jetcharger thoroughly mixes and elevates the material into the gun.



### New machine feeds mix into gunning equipment

For automatically feeding properly mixed sand and cement into gunning equipment, Engineering Equipment, Inc., offers its new Jetcharger.

This machine uses vane feeders to accurately proportion sand and cement. It also thoroughly mixes and elevates the material into the gun, the manufacturer states.

Sand and cement ratio is adjustable from 2:1 to 7:1, with variable output capacities to 14 cubic yards per hour. For easy cleaning, the conveyor bottom drops away.

The Jetcharger is designed to be used in combination with the firm's Jetcrete or Aircrete units for pneumatically placing concrete. However, it works equally well with any similar equipment, according to the manufacturer.

Engineered Equipment, Inc., Dept. C&E, 1001 Linden Ave., Waterloo, Iowa. Circle No. 101 on Request Card.

### Hydraulic winch fits all tractors

The Windsor Pippin Corp. announces a new, completely hydraulic winch. Designated Model 10, the unit has full hydraulic power, and is said



to be capable of line pull of more than 17,000 pounds.

Available with either larger cylinders for more power or smaller cylinders for more speed, this Pippin winch reportedly is easy to install and fits all tractors. It can be used wherever hydraulic power is available; no power takeoff is required. It may also be powered by an electric-motor-driven hydraulic pump.

Windsor Pippin Corp., Dept. C&E, Windsor, Vt. Circle No. 102 on Request Card.

## You Can Put This Line Together With a Hammer

Yes...you can put this line together with only a hammer.

It's that simple when you use the combination of NAYLOR Spiralweld pipe and Wedgelock couplings.

NAYLOR's exclusive lock-seamed-spiralwelded structure gives you pipe that is light in weight without sacrifice of strength and safety. It's easy to transport and handle. Even easier to install when connections are made with Wedgelock couplings. Joints can be made up with only one side of the pipe in the open and replacement of joints can be made at any point without disturbing the balance of the line.

Whether you need piping for air, water, dredging or ventilating service, this NAYLOR combination can save you time, work and money all along the line.

Write for Bulletin No. 59.



NAYLOR Wedgelock couplings make a positive connection securely anchored in standard weight grooved ends.



**NAYLOR  
PIPE Company**

1270 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.

For more facts use Request Card and circle No. 306

CONTRACTORS AND ENGINEERS



## Announce improvements in scraper design

New production benefits including greater capacity, less dead weight, simplified controls, and an optional all-new Powerflow transmission have been announced for the B Tournapull by the LeTourneau-Westinghouse Co. The Powerflow 700 transmission is a constant-mesh, countershaft type of unit with full power shift and torque converter.

The new Model B has a 37-ton capacity—25 yards struck, 32 yards heaped. When fully loaded, it offers a power/weight ratio almost exactly the same as that of the previous, smaller-capacity model, according to the manufacturer. Other improve-

ments include a new tail gate designed to speed loading; new "straight up" scraper side sheets said to make it impossible for rocks to lodge between sides and scraper arms; new bowl-holding safety latches with automatic cutout.

Retained as standard is the unit's GM 430-hp 12V-71 diesel engine. Top speed of the Model B with step-gear transmission is 28.3 mph. With the new power-shift transmission, top speed is 30 mph.

LeTourneau-Westinghouse Co., Dept. C&E, 2301 N. E. Adams St., Peoria, Ill. Circle No. 148 on Request Card bound into this issue.



Power-shift transmission and other improvements are announced for the B Tournapull.

## Tire traction system for snow, ice, mud

Immediate traction in snow, ice, or mud without jacking up or moving the vehicle is said to be possible with the Tractioneer Co.'s dual-tire system. In a matter of minutes the operator can install the dual-tire units with a socket or lug wrench, according to the manufacturer. At normal speeds, the unit is designed to give vibration-free running on or off the road.

Specially formed spring steel traction plates fit over the dual tires, and

are bolted to a connector that is permanently installed in the wheel spacer. The traction plates are securely fastened to the tread of the tires, practically eliminating vibration and tire damage, the company states.

The units are available for both spoke and disk-type wheels.

The Tractioneer Co., Dept. C&E, 460 Wrigley Bldg., 410 N. Michigan Ave., Chicago 11, Ill. Circle No. 57 on Request Card.

## Elevating-grader unit has trailer-type design

A trailer-type elevating-grader attachment that can move 1,000 to 1,500 yards of material an hour, be installed in less than half an hour, and be operated in conjunction with the regular grader blade is offered by the Austin-Western Division of the Baldwin-Lima-Hamilton Corp.

Called the Plainsman, the unit features straight-line cutting and bal-

anced weight distribution between grader rear wheels and the caster wheel on the attachment.

This attachment is 19 feet long and weighs 8,200 pounds.

Austin-Western Division, Baldwin-Lima-Hamilton Corp., Dept. C&E, 601 N. Farnsworth Ave., Aurora, Ill. Circle No. 3 on Request Card that is bound into this issue.

## Electric engine heater for cold-weather starts

A new Chromalox-type KH electric engine heater, for pre-warming truck engines in freezing weather, has been announced by Edwin L. Wiegand Co.

The heater connects into the cooling system of any gasoline or diesel engine, forcing warm water by convection through the engine. This warming reportedly allows quick starting, as well as immediate windshield defrosting and cab or interior warmup, and prolongs battery life. It also eliminates crankcase dilutions and damaging acid accumulations, the manufacturer states.

The heater consists of an aluminum heating chamber, complete with 3-foot cord and plug. A check valve prevents interference with normal cooling circulation if the engine is running. Explosionproof units are available for oil trucks and other hazardous applications.

A variety of models is offered in ranges from 750 to 4,000 watts, and 120 and 240 volts.

Edwin L. Wiegand Co., Dept. C&E, 7100 Thomas Blvd., Pittsburgh 8, Pa. Circle No. 2 on Request Card.

## UNBEATABLE COMBINATION • CONTINENTAL •



## AND THE FINEST CONSTRUCTION EQUIPMENT

Any construction equipment is truly at its best when teamed with Continental Red Seal, the power that's engineered to its work. You find Continentals wherever there's a job to be done, not only in construction, industry and transportation, but

also on the farm. They're helping to build acceptance for leading manufacturers in more and more specialized fields, because they're built to take it, and backed by service coast to coast. "ANY EQUIPMENT IS BETTER WITH DEPENDABLE RED SEAL POWER."

**Continental Motors Corporation**

MUSKEGON • MICHIGAN

For more facts use Request Card and circle No. 305



## LOWEST COST DIGGING Begins With A Vermeer POW-R-DITCHER

If you want more ditch for your dollar, you can't beat the 524T POW-R-DITCHER... the lowest priced BIG ditcher on the market! Digs 8" to 24" wide at speeds of 1' to 15' per minute. Has 2-way dirt conveyor and hydraulically controlled steering with separate steering lever for each track. A self-propelled one-man operated machine that's ideal for contractors, municipalities, utility companies and institutions.

### PICK THE POW-R-DITCHER TO FIT YOUR NEEDS



MAIL COUPON TODAY

Please send me FREE information and prices on the complete Vermeer line of self-propelled POW-R-DITCHERS

NAME.....  
TITLE OR DEPT.....  
FIRM.....  
ADDRESS.....  
CITY..... STATE.....

☐ Also send complete information on your new hydraulically operated back filler... the POW-R-DITCH-FILLER



**VERMEER MANUFACTURING CO.**

1437 W. WASHINGTON • PELLA, IOWA

For more facts, use coupon or Request Card and circle No. 307

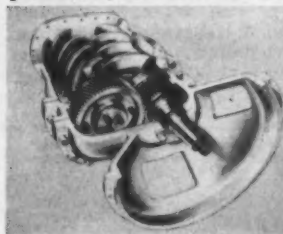


Designed especially for operation in sand, this Challenger lift truck is equipped with tires that permit it to "float" over the softest sand. The mast design allows the operator to tilt the mast forward 56 degrees, placing needed weight on drive tires for traction when the machine is operating without a load. A trunion-mounted steer-axle assembly also allows for greater traction over rough terrain by helping to keep all wheels on the ground. **Champ Corp.**, Dept. C&E, 2500 N. Rosemead Blvd., El Monte, Calif. Circle No. 28 on Request Card.

## NOW! SCRATCH THESE TWO STEPS OFF YOUR COMPRESSOR MAINTENANCE



Tell your compressor man not to open the compression chamber on your new Gardner-Denver Rota-Screw portable. Inside are only two rotating parts which never touch and never wear. He'll find no blades to replace . . . no valves to inspect . . . no place here to check for wear. See your Gardner-Denver distributor . . . or write for details on Rota-Screw portable compressors in capacities of 125, 365, 600, 900 cfm. Instant compressed air; automatic blowdown.



Model SP900



Model SP600



### EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW **GARDNER-DENVER**

Gardner-Denver Company, Quincy, Ill.—Offices in principal U.S., Canadian and Mexican cities  
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario  
International: Gardner-Denver International Division, 233 Broadway, New York 7, N.Y.  
Offices: Buenos Aires, Argentina; Antwerpen, N.S.W.; Australia; Brussels, Belgium; Rio de Janeiro, Brazil; Santiago, Chile; Barranquilla, Colombia; Lima, Peru; Ndola, N. Rhodesia; Salisbury, S. Rhodesia; Johannesburg, Transvaal

For more facts use Request Card and circle No. 309

### Portable power cutters for reinforcing bars

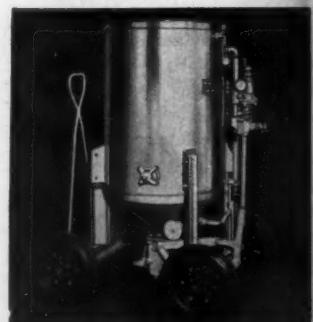
The Chicago Pneumatic Tool Co. announces a series of highly portable Pneudraulic rod cutters, hand-held power tools said to be capable of delivering up to 27½ tons of cutting force.

For snipping reinforcing bars and alloy-steel rods and bolts up to 1-inch diameter, the Pneudraulic rod cutters are powered by a remotely controlled, portable power cell mounted on casters and light enough to be carried. It converts normal shop air pressure up to 7,000 psi.

Compactly designed for close-quarter operations, the tool features a movable handle that can be mounted at right angles to the tool cylinder or in line with it.

Three sizes are available. The smallest, weighing 10½ pounds, is reportedly capable of delivering 12 tons of cutting force.

Chicago Pneumatic Tool Co., Dept. C&E, 6 E. 44th St., New York 17, N. Y. Circle No. 27 on Request Card.



### **RUEMELIN SAND BLASTS**

. . . provide fastest cleaning action. Remove rust, paint, scale from highway equipment, ready-mix drums, rail or highway bridges, water towers.

Available in several sizes, in stationary or portable mountings. Hi-speed trailer mounts permit easy handling. Units available with wet nozzles and remote controls at nozzle for instant stop and start control.

Write for descriptive bulletin.  
**RUEMELIN MFG. CO.**  
3087 No. Palmer St., Milwaukee 12, Wis.

For more facts, circle No. 310

CONTRACTORS AND ENGINEERS





Since the Davis W-36 trencher is self-propelled and has self-locking depth control, the operator can handle other chores while the rig is trenching.

### Compact new trencher for utility operations

The Model W-36 utility trencher is offered by Davis Mfg., Inc.

Powered by a Briggs & Stratton heavy-duty 6-hp engine and self-propelled by a 6-speed winch drive, the W-36 utilizes most of its power for digging with very little required for creeping. The unit trenches from 3 to 6 inches wide to a maximum depth of 36 inches, and will operate at speeds up to 500 feet per hour. It has a built-in protective torque limiter designed to disengage when a shock load is encountered, then re-engage immediately to continue digging.

Another feature of the Davis W-36 is its self-transporting drive. By the pulling of a lever, a friction wheel engages the rear tire and the machine moves to a new trenching site or to its carrier at speeds up to 4.5 mph.

Davis Mfg. Inc., Dept. C&E, 1500 S. McLean Blvd., Wichita 13, Kans. Circle No. 30 on Request Card.

### New grade indicator for graders, dozers

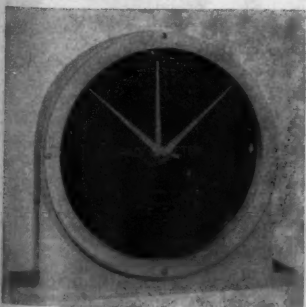
A new grade indicator has been announced by the Fredon Co.

Known as the Grade-O-Meter, it is quickly mounted on any motor grader, bulldozer, scraper, or other equipment. A glance at the 9-inch dial tells the operator the exact slope or grade being cut. Deviations from the horizontal are magnified eight times by the dial indicator.

The dial is scaled to give four simultaneous readings: the actual slope expressed in percentage, the slope expressed as a ratio, and the crown slope on each half of a 24 or 32-foot roadway.

Despite its sensitivity, the Grade-O-Meter is said to be a rugged, durable instrument.

Fredon Co., Dept. C&E, Spearfish, S. Dak. Circle No. 15 on Request Card that is bound into this issue.



### Prime-Mover Concrete Vibrator

Designed on the proven rolling-weight principle that:

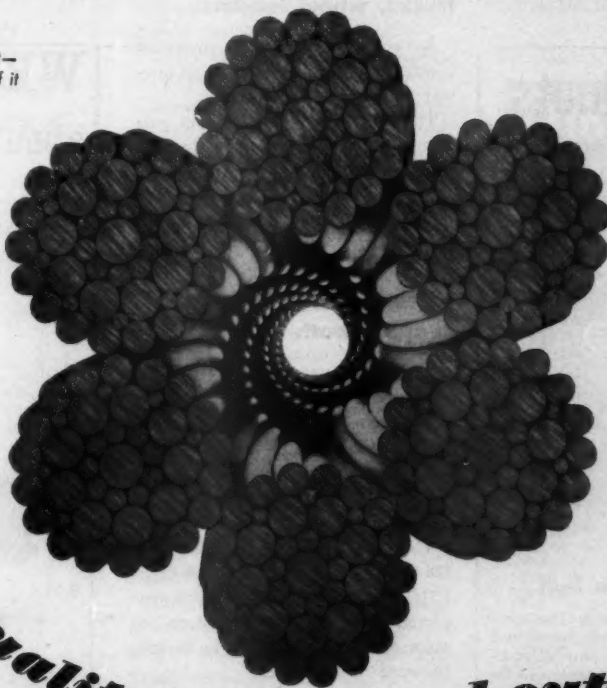
1. Produces high frequency powerful vibrations
2. Permits the shaft to run cool and slow
3. Provides one hand portability
4. Changes from small to large heads quickly
5. Requires fewer parts — less maintenance
6. Gasoline or electric power units

Guaranteed by Prime-Mover Co. — recognized for dependability in concrete handling equipment. Write to us for distributor's name and a demonstration. Prime-Mover Co., Muscatine, Iowa.

**PRIME-MOVER**

For more facts use Request Card and circle No. 312

We put a lot of work into it—  
You get a lot of work out of it



*Quality inside and outside*



Two important angles on wire rope savings: the quality and uniformity Roebing builds all the way through Royal Blue Wire Rope. They give you a big, extra margin of service through every kind of wear and tear—and combine to make extra

strong Roebing Royal Blue the toughest wire rope you can buy. Find out more from your wire rope distributor, or write for free booklet to Roebing's Wire Rope Division, Trenton 2, N. J.

**ROEBLING**

Branch Offices in Principal Cities  
John A. Roebing's Sons Division  
The Colorado Fuel and Iron Corp.

For more facts use Request Card and circle No. 311



New automatic trip-edge Balderson snowplows are now available for most trucks and for all Caterpillar wheel loaders. This safety feature is built into both one-way and reversible plows.

### Trip-edge snowplow for trucks, wheel loaders

An automatic trip-edge snowplow is offered in both reversible and one-way models by Balderson, Inc.

The unit's spring-loaded trip cutting edge allows the plow to ride over any hidden obstruction.

Balderson, Inc., Dept. C&E, Wamego, Kans. Circle No. 107 on Request Card.

### Motor-generator set supplies both ac and dc

A motor-generator set that can supply both 120 to 208-volt, 400-cycle ac and 20 to 30-volt dc at once is announced by Kato Engineering.

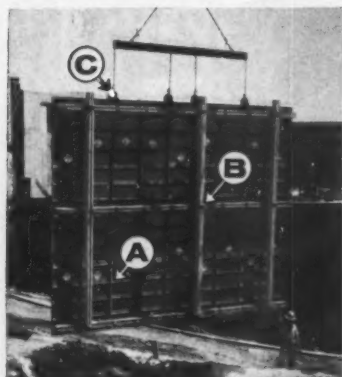
Input is provided by a 20-hp 550-volt ac, 3-phase, 60-cycle, 1,714-rpm, squirrel-cage type of induction motor.

The generator is a 10-kw 12.5-kva, 120 to 208-volt ac, 3-phase, 400-cycle, 1,714-rpm unit, with a direct-connected exciter. Also, mounted on the same shaft is a 2-kw 20 to 30-volt, 100-amp dc generator.

Kato Engineering Co., Dept. C&E, 1415 First St., Mankato, Minn. Circle No. 33 on Request Card that is bound into this issue.

## New Products

### speed-up gang forming



### New gang form bolt

Eliminates the necessity of stripping and resetting panels individually. Panels can be added or removed at any time. After gang section is set in place, ties are inserted. When stripping, ties can be broken back before removing section.

### New gang form waler set

Attaching walers to gang sections is faster and easier. Simply insert waler rod between double waler, slip bracket over waler rod, and fasten securely with a wing nut. 6" and 8" rods are used with 2 x 4 and 2 x 6 walers...13 1/4" rods available for 2 x 4 or 2 x 6 walers with 2 x 6 strongbacks.

### New gang form lifting bracket

Secure cable hooks to lifting brackets, and gang section is ready for stripping and setting. Safe recommended load per bracket is 2000 lbs. Approximate weight of square foot of section is 6 lbs (including hardware, walers and strongbacks.)

Write for more information about these new products.

**Symons**  
**SYMONS CLAMP & MFG. CO.**  
 4251 Diversay Ave., Dept. M-1, Chicago 39, Ill.  
 Warehouses Throughout the U.S.A.  
**MORE SAVINGS FROM SYMONS**

For more facts, circle No. 313

### Plastic cylinder mold for concrete testing

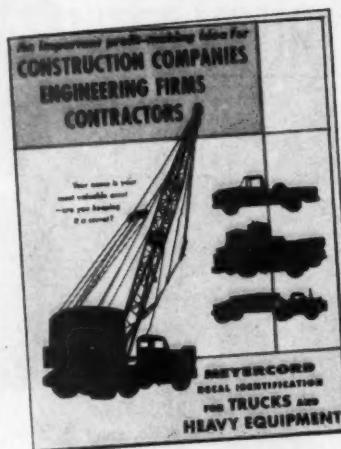
A re-usable plastic concrete cylinder mold is now available from Soiltest, Inc. The mold may be used on the job site or in the laboratory to prepare 6 x 12-inch concrete cylinders for testing purposes.

Designated P-C-M, it is made in two half-sections of durable nonabsorbent plastic material said to be completely impervious to water. Two formed aluminum clamps hold the mold together at the seams.

Soiltest, Inc., Dept. C&E, 4711 W. North Ave., Chicago 39, Ill. Circle No. 149 on Request Card.



## WRITE-NOW for this new folder about MEYERCORD DECALS for your equipment!



**why?** Because in the construction business, your name and your reputation are your two most valuable assets. Because the opportunity to use the space on your equipment to publicize and "sell" your name is worth thousands of dollars every year to your firm! This new folder tells how MeyerCORD has produced decal signs and identification for more construction equipment, truck fleets, earthmoving machines and agricultural equipment... than any other decal manufacturer. Whether your needs are large or small, MeyerCORD has the equipment, art talent and field service program to do the job for you... completely.

Ask for the new folder on your letterhead, please. No obligation!



**the MEYERCORD co.**

Dept. W-316, 5323 West Lake Street, Chicago 44, Illinois

For more facts use Request Card and circle No. 315

reliable  
 maintenance  
 is easy  
 with  
 experienced

**STA-CRETE**  
 epoxy resins

for industry, agriculture, warehouses, office buildings, institutions, refineries, plants, highways

Maintenance men specify STA-CRETE to solve hundreds of maintenance problems. Practically indestructible. STRONGER THAN CONCRETE. STA-CRETE epoxies are the solutions for repairing, resurfacing, patching, bonding, strengthening, waterproofing, and just plain wear and tear problems. Economical and easy to handle. Use only what you need; your supply will never deteriorate. Surface ready for heavy traffic overnight.

See your dealer or write:  
**STA-CRETE, INC.**

115 New Montgomery St.  
 San Francisco 5, Calif.

For more facts use Request Card and circle No. 314



## DON'T THROW AWAY CRACKED DIESEL CYLINDER HEADS

You can save 50% of replacement cost with Factory Rebuilt Swick-Guth Heads. Swick-Guth restores cracked or worn heads, blocks, transmission cases to a Guaranteed good as new condition by the Controlled Heat Process... successfully used for more than a Quarter Century.

GUARANTEED TO YOUR SATISFACTION



Send today for price list and a free booklet on the famous Swick-Guth Process, and the name of the dealer nearest you.

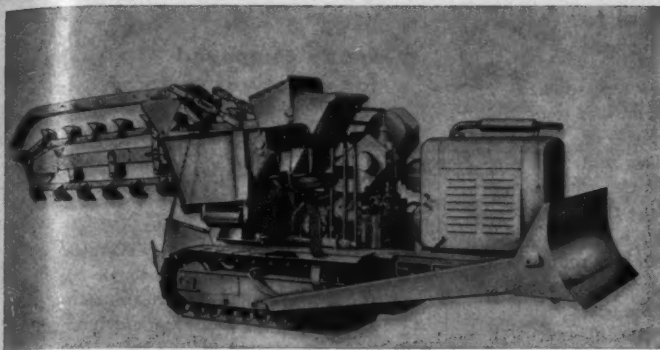
**SWICK-GUTH CO.**  
 INDEPENDENCE, KANSAS FORMERLY GUTH CO.

SPECIALISTS IN WELDING DIESEL CASTINGS

For more facts use Request Card and circle No. 316

CONTRACTORS AND ENGINEERS





The new backfill blade offered for the Parsons Trenchliner Model 77 has a removable cutting edge of ½-inch-thick steel.

### New backfill blade offered for trencher

A new backfill blade for its Model 77 Trenchliner has been announced by the Parsons Co.

The blade is available as optional equipment for new 77's or as an attachment for certain machines already in the field. It can be used for small backfilling jobs and to grade ahead of the 77. It is 60 inches wide, 25 inches high, and is double-acting through hydraulic cylinders. In raised position, the blade has 12 inches of ground clearance.

Quick attach and detach design is an important feature.

Parsons Co., division of Koehring Co., Dept. C&E, P. O. Box 431, Newton, Iowa. Circle No. 51 on Request Card.

### New protective coating for steel structures

A new corrosion-preventive coating for steel structures is announced by the Products Research Co.

PRC 430 zinc coating is a 2-part single-system finish containing special organic binder that reportedly is not subject to alkaline attack. It is resistant to hydrocarbons and most organic solvents, and in addition does not have the water-leaching sensitivity of inorganic binders, the manufacturer states.

The new zinc coating is resistant to mechanical damage, and is said to offer especially effective protection in salt-water environments.

Products Research Co., Dept. C&E, 2919 Empire Ave., Burbank, Calif. Circle No. 108 on Request Card.

### New sealing material offers many features

A new, completely watertight sealing material of polyurethane plastic foam impregnated with asphalt is offered by Asbiton Western, Inc.

Called Compriband, it is said to be ideal for applications such as concrete expansion joints.

The material reportedly is light, clean, and easy to handle; has a very long life potential; is chemically inert; and can be used through a range of temperature conditions from 160 degrees F to minus 55 degrees F.

Asbiton Western, Inc., Dept. C&E, 1491 Daisy Ave., Long Beach, Calif. Circle No. 109 on Request Card.

**ON-TIME**  
maintenance cuts  
down-time **DOWN**  
**Hobbs**  
**INDUSTRIAL**  
**HOUR METERS**

For use with diesel, gasoline and electric powered equipment

**PLANNED MAINTENANCE** based on actual hours of use is the answer to more GO-time and less DOWN-time on your equipment!

**TRUE RUNNING TIME** gives you a realistic basis for renting and leasing, service contracts, buying and selling.

**HOBBS** electrical timing instruments are the basic source for the facts you need—revolution counters cannot do the job. Distributors in principal cities... WRITE FOR CATALOG 600.

**John W. Hobbs Corporation**  
— A DIVISION OF STEWART-WARNER CORPORATION —  
2967 YALE BLVD. SPRINGFIELD, ILLINOIS

For more facts use Request Card and circle No. 318

## Only Crosby-Laughlin hooks

say what they do  
do what they say

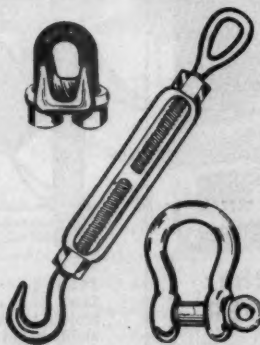
**Load-Rated®**

**SAFER**—load capacity is permanently forged on every hook... eliminates guesswork, overloading.

**EXTRA CAPACITY**—forged, heat treated, and tested to give you industry's highest guaranteed capacity per size.

**WIDEST LINE**—¾ thru 150-ton capacities... all popular shapes and types... carbon steel, alloy steel, or non-sparking bronze.

CL-951



Free catalog gives application data for 2000 types and sizes of forged fittings for wire rope and chain. Ask your distributor for your copy.

**CROSBY LAUGHLIN**

FT. WAYNE, INDIANA

For more facts use Request Card and circle No. 317

## Talk Two-Way

- on your job
- in your car
- in your office



**PERSONAL-COM 300**  
Hand-Held 2-Way Radio

Rugged, dependable, fully transistorized 27-megacycle portable 2-way radio, designed specifically for business and industrial uses. Small and light, weighs less than one pound. Has 11-volt mercury battery for 50 hours' operation. Factory-installed plug-in module available to increase transmit power.



**MARK VII "Top-of-the-Line"**  
Citizens' Band 2-Way Radio

Short-range communications facilities for business service and personal needs. Ideally suited for use on materials handling vehicles, or for 2-way conversation between fixed points. Also serves as excellent base station for hand-held radio. 6 or 12 V DC or 115 V AC operation.



**LOW-COST INTERCOM**

A complete line of quality Intercom—wired, or wireless—designed for office, factory or home use, at lowest prices. Suitable for many applications, from simple wireless 2-way talk-listen systems to flexible, multi-unit systems with a variety of talk-listen-monitor options.

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The Most Trusted Name  
in Electronics  
RADIO CORPORATION OF AMERICA

**RADIO CORPORATION OF AMERICA**

Special Products Department

Dept. C-277, Meadowlands, Pa.

Please send me complete information on the following:

☐ RCA PERSONAL-COM 300

☐ RCA Mark VII ☐ RCA Intercom

NAME \_\_\_\_\_

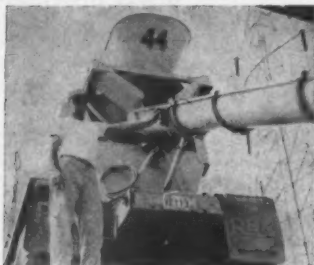
TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

For more facts, use coupon or circle No. 319



The new Rex drum control fastened to a chute allows the truck operator to control discharge by holding or swinging the chute.

### Push-button control for truck-mixer discharge

Introduction of a new truck-mixer drum control, said to provide complete control of discharge by one man at the end of the mixer chute, has been announced by the Construction Machinery Section of the Chain Belt Co.

The new, hand-sized Rex control can be fastened to a section of the chute or, for long-distance pours such as those for basements, footings, foundations, and bucket loadings, it can be operated by means of a flexible remote air line stretching up to 30 feet or more.

This push-button control is air-operated, drawing air from the truck's air-brake system. As such, it actuates the drum brake as well as the drum clutch and is free of electrical maintenance problems.

Chain Belt Co., Construction Machinery Section, Dept. C&E, 4701 W. Greenfield Ave., Milwaukee 1, Wis. Circle No. 54 on Request Card.

### New line of bearing pads for bridge construction

A new, standard line of laminated elastomeric bearing pads for bridge construction is available from the Lord Mfg. Co.

Bonded neoprene construction is used in the pads, which are said to meet all existing state highway specifications. They are available in two basic sizes: 25 x 8 x 1 1/4 inches, and 12 1/2 x 8 x 1 1/4 inches.

Stacking pads in multiples permits them to meet various load conditions. According to the manufacturer, they are simple to install, eliminate moving parts, and require no servicing.

Lord Mfg. Co., Dept. C&E, Erie, Pa. Circle No. 55 on Request Card.

### "BERG" CONCRETE SURFACERS

For Surfacing:  
Bridges, Highways,  
Airport Runways, Dams,  
Culvert, Floors, Walls.



MODEL H10 (ABOVE)

Gasoline-powered unit especially designed for surfacing concrete highways, runways, streets, floors. Includes exclusive power takeoff for attaching "BERG" flexible shaft surfacing equipment.

WIRE OR WRITE  
FOR DETAILS . . .



MODEL A (ABOVE)

Lightweight, electric-powered unit that suspends from operator's shoulder. Equipped with interchangeable heads and attachments for surfacing bridges, buildings, dams, culvert, walls or similar surfaces.

### CONCRETE SURFACING MACHINERY CO.

4665 SPRING GROVE AVE.

CINCINNATI 32, OHIO

For more facts, use Request Card and circle No. 320



### NEW detachable ALL-weather CAB for Hough PAYLOADER

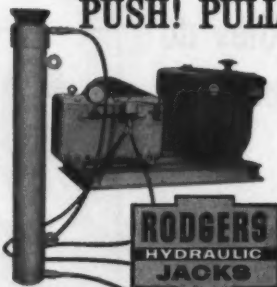
Enables your operator to work comfortably in all kinds of weather. Approved design for new Payloader models; fits perfectly, made of heavy gauge sheet steel and angle iron frame. Full vision SAFETY GLASS windows, mounted in rubber, right side and rear windows slide open for ventilation. Door for easy access. Optional accessories include windshield wipers, heater-defroster, sun visor and rear view mirror. Campbell cabs are specifically designed for all Payloader models — see your Payloader distributor or write direct.

**CAMPBELL**

detachable cab company  
WAUCONDA, ILL.

For more facts, use Request Card and circle No. 321

### LIFT! PRESS! PUSH! PULL!



You'll find RODGERS Hydraulic Jacks on nearly every construction project because of their easy adaptability to any heavy lifting, pulling, or pushing job. Use RODGERS jacking cylinders singly or in groups. You'll get steady, precisely-controlled power to jack steel casing, corrugated pipe, or compressed concrete tile. And you can use them to raise bridges, lift buildings, prestress concrete. Available for immediate delivery, with cylinder capacities of 50 to 600 tons, hand operated or power driven. Get full details.

**RODGERS HYDRAULIC, INC.**

Pioneer in high-pressure hydraulics, since 1932  
7401 Walker St. • Minneapolis 26, Minnesota

For more facts, circle No. 322

### Epoxy compound for variety of surfaces

The Dennis Chemical Co. offers its No. 6713 epoxy surfacing compound said to be valuable for quick maintenance and repair of roadways, bridges, and other surfaces.

When applied 1/8 to 1/4-inch thick, the compound reportedly equals the strength of up to 2 inches of concrete. According to the manufacturer, it is resistant to alcohol, acid, and abrasion.

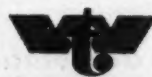
Dennis Chemical Co., Dept. C&E, 2701 Papin St., St. Louis 3, Mo. Circle No. 31 on Request Card.



### NEW WISCONSIN LOW BED CUTS TIME AND LABOR COSTS!

Model 3000

No longer do you need individual trailers for "problem" loads . . . this WISCONSIN Low Bed handles everything! Big, tough and maneuverable . . . it's a steady money-maker . . . cutting time and labor costs every haul. Built low for safe, easy equipment transfer. Choice of straight, drop or beaver tail deck. Models 22, 27 or 30-ton capacity. Side or end load. Doubler plates at all critical welds . . . oscillating walking beams independently suspended . . . extra wide flange beams entire deck length. Get the complete story . . . write



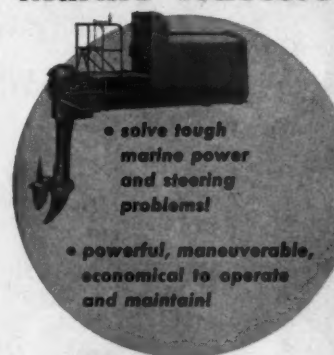
**WISCONSIN TRAILER COMPANY, INC.**  
RICHFIELD, WISCONSIN

HUBERTS 100

Models from 4 through 30-ton capacity

For more facts, use Request Card and circle No. 323

### Harbormaster Marine Tractors



• solve tough marine power and steering problems!

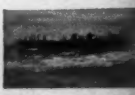
• powerful, maneuverable, economical to operate and maintain!

Harbormaster Marine Tractors are heavy duty outboard propulsion and steering units. They are a complete package, quickly and easily installed for immediate use on new or existing craft. Efficient and economical to operate and maintain, they give you many advantages over inboard marine power. Wherever you operate . . . shallow or deep water, along the coast, in harbors, lakes, canals or rivers . . . Harbormaster is ideal. The advantages of Harbormasters . . . shorter trip times and exceptional maneuverability and versatility . . . have been proved in hundreds of installations. Models range from 40 to 500 hp, gas or Diesel. Available with direct or remote controls.

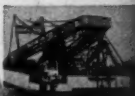
**MURRAY & TREGURTHA, INC.**

44 Hancock Street • Quincy 71, Massachusetts

For more facts, use Request Card and circle No. 324



Steer in any direction with full power



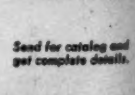
Rugged, powerful, easily installed



Shallow water protection



Economical operation and maintenance



Send for catalog and get complete details.

CONTRACTORS AND ENGINEERS

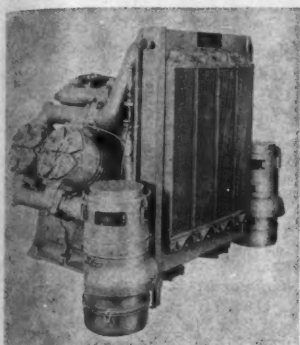


A 30,000-pound-capacity load cell, in use at the Arizona Prestressed Concrete Co., is anchored at one end between two I-beams. The other end of the Dillon unit is hooked in series with a hydraulic jack that applies the desired tension to the steel strand. The tension is registered on the remote indicator in actual pounds. The indicator can be placed 1,000 feet away if necessary. W. C. Dillon & Co., Inc., Dept. C&E, 14620 Keswick St., Van Nuys, Calif. Circle No. 111.



### Air-cooled compressors are self-contained units

A new series of air-cooled stationary compressors designed to deliver from 200 to 600 cfm of air at 250 psi



has been developed by Le Roi.

Completely self-contained, these compressors operate with a load-unload pressure control system.

The 3-cylinder Model 253-S2 delivers 200 to 275 cfm through a single high-compression head from a power takeoff or separate engine drive. The 6-cylinder Model 256-S2 produces 400 to 600 cfm, depending on the rpm selected.

Westinghouse Air Brake Co., Le Roi Division, Dept. C&E, Sidney, Ohio. Circle No. 110 on Request Card that is bound into this issue.

### Cream protects against dry or wet cement burns

A specially formulated protective barrier cream that is said to prevent alkali burns from wet-cement handling and dry cement dust in the atmosphere is available from Ayerst Laboratories.

Called Kerodex No. 71, it is a greaseless cream that reportedly will not affect the skin, and is waterproof. Workers exposed to the corrosive alkalinity of wet cement apply it to hands, wrists, and forearms. Those working in areas with dry powder suspensions in the air apply it also to face, neck, and ankles. The cream effectively prevents the dermatitis, irritation, and burning caused by cement alkali and plastering compounds, according to the manufacturer.

Ayerst Laboratories, Dept. C&E, 685 Third Ave., New York 17, N. Y. Circle No. 58 on Request Card that is bound in this issue.

For more facts, use Request Card and circle No. 325 →

DECEMBER, 1961

WHY  
THE "PROS"  
PREFER  
PERFECT CIRCLE  
PISTON  
RINGS...

PERFECT CIRCLE PISTON RINGS ARE  
INSTALLED AS ORIGINAL FACTORY EQUIPMENT  
IN 94 BRANDS OF VEHICLES AND ENGINES

RADIAL-ACTIVE DESIGN

ASSURES  
BETTER  
CONFORMABILITY

NEW PC  
VALVE SEALS  
Stop oil loss past  
valve guides, reduce  
valve sticking.  
For superior  
performance,  
install PC Valve  
Seals with  
every ring  
job

The basic metal used in Perfect Circle rings is specially selected for its active, spring-like qualities. And, each ring is carefully engineered to distribute its radial pressure properly for maximum conformability, even in tapered and out-of-round cylinders.

This radial-active design results in sustained compression, less blow-by and positive oil control. It's one of the many reasons why leading engine and vehicle manufacturers, fleet operators, race drivers and mechanics the world over prefer and specify Perfect Circle piston rings.

For lasting performance, always install genuine Perfect Circles—the rings the "pros" prefer.

PERFECT CIRCLE

PISTON RINGS • POWER SERVICE PRODUCTS  
HAGERSTOWN, INDIANA • DON MILLS, ONTARIO, CANADA

## Winslow

TRUCK SCALES  
PIT AND PITLESS TYPES

Capacities: 15, 18, 20, 30, 40,  
50, 60 and 70 tons.

For use at temporary and per-  
manent locations, stockpiles,  
and by bituminous material  
contractors at the jobsite.

Write or phone  
Dept. B-70 today  
Phone NORTH 1231.

WINSLOW GOVERNMENT STANDARD SCALE WORKS, INC.  
25TH & HAYTHORNE TERRE HAUTE, IND.

For more facts use Request Card and circle No. 326



TYPE CS — PITLESS — PORTABLE



### Special alloy rods for rock drilling

The addition of Drillalloy rods to  
its line of rock-drilling tools has been  
announced by Brunner & Lay, Inc.  
Drillalloy has a large blowhole and

is available in 1½-inch round for  
with rope threads. It is shot-peened  
to insure added fatigue resistance.  
In addition, it may be rethreaded  
the job without heat treatment.  
Uncoupling is by hand, with  
wrenches necessary.

Brunner & Lay, Inc., Dept. C  
9300 King St., Franklin Park,  
Circle No. 4 on Request Card.

### Improvements announced for soil compactors

The Jay Division of the J. Leukart  
Machine Co., Inc., announces im-  
provements, on its Models J-13, J-36  
and J-36 soil-compaction units, that  
are said to permit greater control and  
easier starting.

Models J-13 and J-36 now have a



standard equipment, a centrifugal  
clutch that permits the operator to  
stop forward motion and vibration  
without stopping the engine. Idling  
the engine disengages the clutch.

All three models now use a new  
carburetor and fuel line, which per-  
mits varying the engine speed for best  
compaction results and for easier  
starting.

Jay Division, J. Leukart Machine  
Co., Inc., Dept. C&E, 2222 S. Third  
St., Columbus 7, Ohio. Circle No. 18  
on Request Card.

## Look into this culvert if you're looking for culvert that lasts



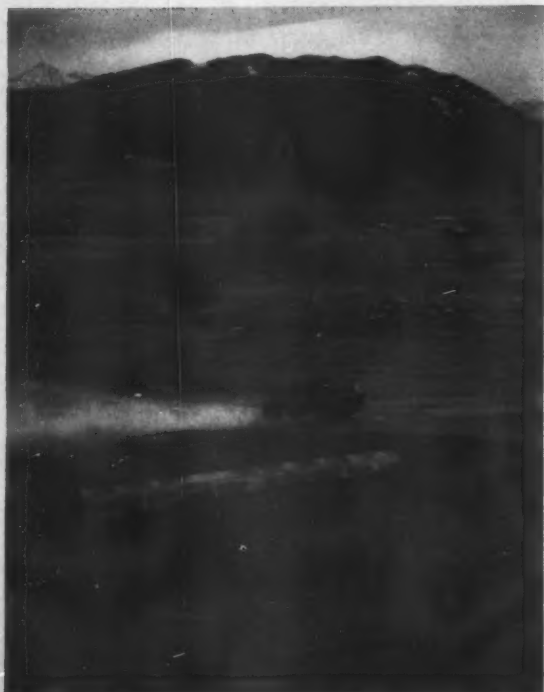
This 232-foot-long culvert will carry irriga-  
tion water under a new four lane highway  
near Livingston, Montana. It's made from  
USS AmBridge Sectional Plate: a tough,  
zinc-coated corrugated steel product that's  
famous for long life. Many steel culverts like  
this one have already outlasted the highways  
they were buried under.

USS AmBridge Sectional Plate is avail-  
able in a complete range of sizes and is fab-  
ricated to meet all federal and state speci-  
fications. It's highly corrosion resistant and is  
pre-punched for fast assembly. Just smooth  
the grade line, set the sheets into place, bolt  
them together and then backfill. No need to  
build forms or sit out costly curing time.

American Bridge has a new booklet about  
USS AmBridge Sectional Plate. Write for  
your free copy. American Bridge Division,  
525 William Penn Place, Pittsburgh 30, Pa.

USS and AmBridge are registered trademarks

This mark tells you a product  
is made of modern, dependable Steel.



### General Offices:

525 William Penn Place, Pittsburgh, Pa.

### Contracting Offices in:

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Cincinnati • Cleveland •

Dallas • Denver • Detroit •

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Houston • Los Angeles •

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Pittsburgh • Portland, Ore. •

Roanoke • St. Louis •

San Francisco • Trenton •

United States Steel Export Company, New York



American Bridge  
Division of  
United States Steel

For more facts use Request Card and circle No. 327

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SPECIAL  
DRILLING  
PROBLEMS

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BIRMINGHAM, ALA.  
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CONTRACTORS AND ENGINEERS



# Convention Calendar

## December 8-9 Contractors Management Conference

Meeting, Pleasant Hall, Adult Education Center, Louisiana State University, Baton Rouge, La. General Extension Division, Louisiana State University, Baton Rouge, La.

## December 11-14 Weed Society of America

Meeting, Sheraton Jefferson Hotel, St. Louis, Mo. Dr. O. Hale Fletcher, College of Agriculture, University of Missouri, Columbia, Mo.

## January 15-18 National Concrete Masonry Association

Forty-second annual convention, Americana Hotel, Bal Harbour, Fla. NCMA, 1015 Wisconsin Ave. N.W., Washington 7, D. C.

## January 15-19 National Limestone Institute, Inc.

Meeting, Roney Plaza Hotel, Miami Beach, Fla. NLI, 210 H St. N.W., Washington, D. C.

## January 24-26 New York State County Highway Superintendents' Association

Winter meeting, Sheraton-Ten Eyck Hotel, Albany, N. Y. Harry R. Mason, secretary, Fonda, N. Y.

## January 25-26 National Society of Professional Engineers

Winter meeting, King Edward Hotel, Jackson, Miss. Robert H. Young, chairman, P. O. Box 1026, Jackson, Miss.

## January 28-February 1 Associated Equipment Distributors

Annual meeting, Hilton Hotel, Chicago. AED, 30 E. Cedar St., Chicago 11, Ill.

## February 2-9 Northwest Roads and Streets Conference

Campus of Oregon State University, Corvallis, Ore. J. Al. Head, conference chairman, State Highway Bldg., Salem 10, Ore.

## February 5-9 National Sand and Gravel Association and National Ready Mixed Concrete Association

Combined biennial show and conventions, the Conrad Hilton Hotel and McCormick Place Convention Center, Chicago. NSGA, 1411 K St. N.W., Washington 5, D. C.

## February 17-22 National Bituminous Concrete Association

Seventh annual convention, The Flamingo Hotel, Las Vegas, Nev. NBCA, 1145 19th St. N.W., Washington 6, D. C.

## February 19-23 American Society of Civil Engineers

Regional Convention, Shamrock Hilton, Houston, Texas. Otis D. Gouty, ASCE, 245 E. 47th St., New York 17, N. Y.

## February 26-March 1 Associated General Contractors

Annual meeting, Los Angeles. AGC, Ramsey Bldg., Washington, D. C.

## Engineering students win welded-design awards

Awards totaling \$10,000 have been given to 53 engineering students in the annual competition for arc-welded designs of machines or structures, which is sponsored by The James F. Lincoln Arc Welding Foundation of Cleveland, Ohio.

In the Structural Division, the \$1,500 first prize was won by James M. O'Neal Rensselaer Polytechnic Institute.

The \$750 second prize went to Perry Horacek and Stewart McMinimy, Oklahoma State University.

The \$500 third prize was granted to Donald Olson and Richard A. Soderberg, Northwestern University.

Four \$250 fourth-place awards were given Jon Ronald Garcia, California State Polytechnic; Lilvon L. Michael,

University of Wyoming; Joseph M. Garcia, New York University; and Stanley E. Panko, Washington State University.

In the contest's Machinery Division, top prizes were awarded to the following: first place, Roland W. Gertenberger, University of Miami (Fla.); second place, Alfred E. Barkman, University of Wyoming; third place, Glenn F. Balfanz, Jr., Northwestern University. Fourth prizes went to Christian Doerschlag, Ohio State University; Arthur J. McKee, University of Wyoming; R. Bruce Cuthbertson, Massachusetts Institute of Technology; and Donald M. Wilhelm, University of California.

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## Product literature in December advertisements

The following free catalogs, bulletins, and other specific literature are offered by manufacturers advertising in this issue and whose advertisements were in our hands by December 15. To obtain any item, circle the designated number on the Request Card.

**Wheel dozer**—Data on the Hough D-500 Paydozer, a rubber-tire pusher and dozer. Circle No. 98 on Request Card.

**Horizontal boring machine**—Illustrated literature and prices on a new Calweld horizontal boring machine for holes 6 to 60 inches in diameter and up to 300 feet long. Circle No. 85 on Request Card.

**Ditchers**—Information and prices on the complete Vermeer line of self-propelled Pow-R-Ditchers. Circle No. 97 on Request Card.

**Dump trailers**—Literature covering the complete Trailmobile line of dump trailers. Circle No. 96 on Request Card.

**Engines**—Bulletin No. 1415 featuring the Waukesha Model WAKD diesel engine, a 6-cylinder unit offering up to 258 horsepower. Circle No. 118 on Request Card.

**Engine bearings**—Catalog of Monmouth solid aluminum and steel-backed aluminum bearings for Caterpillar engines. Circle No. 93 on Request Card.

**Welding accessories; safety equipment**—Catalog on Jackson arc-welding accessories and safety equipment. Circle No. 92 on Request Card.

**Concrete-placement equipment**—Brochure No. CP-881 describing Airplaco concrete-placement equipment. Circle No. 91 on Request Card.

**Trencher**—Descriptive literature on the Speicher tandem-traction trencher. Anchor Sales Corp. Circle No. 90 on Request Card.

**Lubricant**—"Lubriplate Data Book," a booklet on Lubriplate grease and fluid-type lubricants. Fiske Bros. Refining Co. Circle No. 89 on Request Card.

**Sandblasters**—Descriptive bulletin on Ruemelin sandblasting equipment available in several sizes, in stationary or portable mountings. Circle No. 88 on Request Card.

**Marine tractors**—Catalog giving complete details on Harbormaster

marine tractors featuring heavy-duty outboard propulsion and steering units. Murray & Tregurtha, Inc. Circle No. 87 on Request Card.

**Hour meters**—Catalog No. 600 on the benefits of Hobbs industrial hour meters. Circle No. 86 on Request Card.

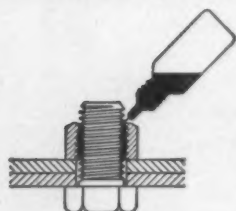
**Roller chains**—Complete specifications and usage recommendations for Diamond roller chain. Circle No. 84 on Request Card.

**Derricks, hoists, winches**—Catalog on the Sasgen line of contractor derricks, hoists, and winches. Circle No. 82 on Request Card.

**Rammers**—Catalog No. 621 discussing Barco rammers, which are said to be especially effective for compacting fill in restricted areas. Circle No. 81 on Request Card.

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**Pipe**—Bulletin No. 59 on Naylor Spiralweld pipe and Wedgelock couplings. Circle No. 117 on Request Card.

**Space heaters**—Information on the complete Herman Nelson line. American Air Filter Co., Inc. Circle No. 145 on Request Card.

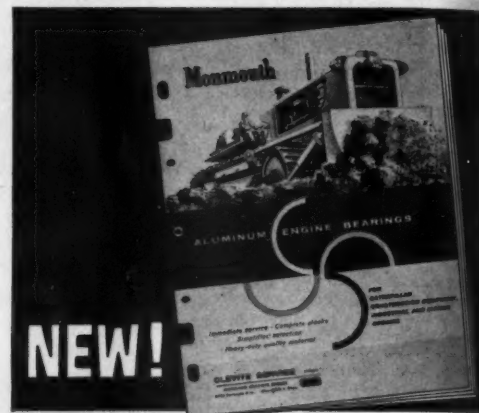
**Trailers**—Illustrated catalog on Birmingham platform, low-bed, and special-type trailers. Circle No. 143 on Request Card.

**Submersible pump**—Complete specifications on the Econ-O-Merse III 3-inch submersible pump. Marlow Pumps. Circle No. 144 on Request Card.

**Loader**—Data on the Model H-70C 2½-yard Payloader. The Frank G. Hough Co. Circle No. 115 on Request Card.

**Material-handling unit**—Catalog on features and versatility of the Econmobile. American Road Equipment Co. Circle No. 116 on Request Card.

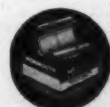
**Clutches**—Bulletin C111-4 giving information on clutch adjustment and lubrication, plus helpful hints on reduction of maintenance through proper driving habits. Dana Corp. Circle No. 80 on Request Card.



### Illustrated Engine Bearing Catalog

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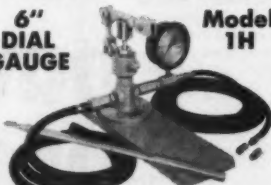
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**Versatile crawler**—Literature on the P&H Model 315 crawler with complete attachments for hoe, shovel, dragline, crane, and clamshell. Har-nischfeger. Circle No. 83 on Card.

**Welder/power plant**—Details and engine specifications on the Miller DD-250-L dc welder/ac power plant. Circle No. 94 on Request Card.

**Hardsurfacing**—Literature describing Stoddy 1105, a manual hard-surfacing electrode. Circle No. 78 on Request Card.

**Portable lube equipment**—Catalog on Graco portable lube equipment. Gray Co., Inc. Circle No. 77 on Request Card.

**Head, block repair**—Booklet on the Swick-Guth process for restoring cracked or worn diesel cylinder heads, blocks, and transmission cases. Circle No. 95 on Request Card.

**Wire rope, chain fittings**—Catalog giving application data for 2,000 types and sizes of forged fittings for wire rope and chain. Crosby-Laughlin. Circle No. 79 on Request Card.

**Rebar bender**—Literature on the Klingelhofer automatic rebar bender that is available in four sizes. Circle No. 146 on Request Card.

**Vibrators**—Brochure describing the entire Dart line of concrete vibrators. Circle No. 147 on Request Card.

### Maine's Interstate 95 wins "beauty" contest

■ A 24-mile section of Interstate 95 between Augusta and Fairfield, Maine, has been designated America's most beautiful highway opened to travel

since Sept. 1, 1960.

Judges of the contest, sponsored by Parade magazine, were Jack Wood of the American Civic and Planning Association; Kermit Rykken of the American Automobile Association; Dudley C. Baylis of the American Society of Landscape Architects; and Ellis L. Armstrong of the Better Highways Information Foundation.

The winning highway was designed by Robert C. Furber, Maine State Highway Commission Engineer, and Clarkson Engineering Co., Boston.

Awarded honorable mention in the contest were sections of Interstate 89 in Vermont, Interstate 93 in New Hampshire, and 75 in Michigan.

A list of conventions of interest to our readers appears on page 73.

### James D. Marshall, AGC director, dies

■ James D. Marshall, executive director of The Associated General Contractors of America, died November 3 in Washington, D. C. He was 74 years old. William E. Dunn has been appointed to succeed him.

Mr. Marshall had been connected with the AGC since 1925 when he became manager of the Minnesota branch. He went to Washington headquarters in 1934 as manager of the Heavy Construction and Railroad Contractors' Division. He became assistant managing director in 1940 and executive director in 1953. Since 1956, he has been chief executive in the management of the contractors' association.

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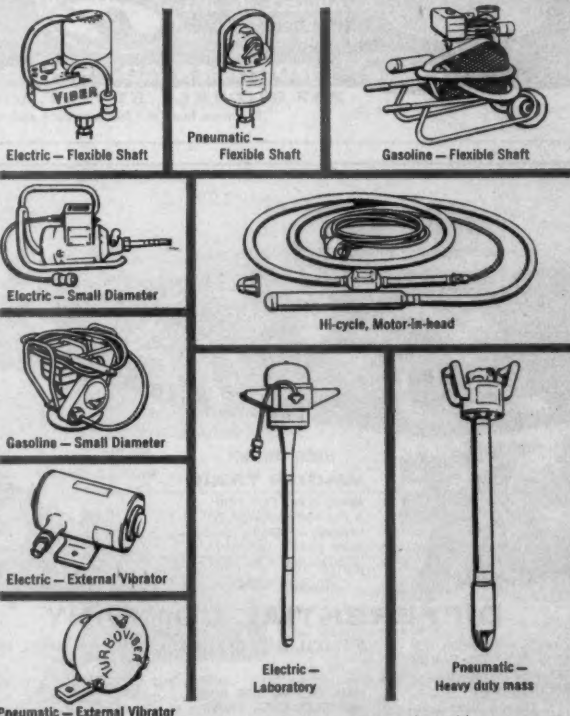
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**Hardsurfacing electrodes**—Catalog of individual data sheets on the complete Alloy Rods line of hardsurfacing electrodes and wires. Gives application data, as well as typical physical and chemical properties of the deposited weld metal.

Alloy Rods Co., Dept. C&E, P. O. Box 1828, York, Pa. No. 119.

**Penetrometer**—Bulletin describing three types of Solitest penetrometers used to determine the rate of set of concrete—a pocket concrete penetrometer for field use, a mortar penetrometer for field or laboratory use, and a laboratory penetrometer.

Solitest, Inc., Dept. C&E, 4711 W. North Ave., Chicago 39, Ill. No. 120.

**Automatic level**—Fact sheet on the Pilotecnica Salmoiraghi Model 5173 automatic level. Primarily a dumpy level, the unit has an objective

lens suspended as a pendulum instead of fixed in place. Illustrated with photographs.

Texas-Asiatic Import Co., Dept. C&E, 2127 Fort Worth Ave., Dallas 11, Texas. No. 121.

**Chemical grout**—Booklet on AM-9 chemical grout, which is said to be particularly effective for solidifying weak, granular soil masses during tunneling operations, during the

sinking of caissons, and in many types of shafts and excavations. American Cyanamid Co., Dept. C&E, 30 Rockefeller Plaza, New York 20, N. Y. No. 122.

**Spreaders**—Folder illustrating and describing Temple stone and chip spreaders. According to the literature, the unit adjusts to fit all trucks with inside body widths from 6 to 7 feet. Temple Stone & Chip Spreader Co., Dept. C&E, 2335 Kutztown Road, Reading, Pa. No. 123.

**Pre-blended cement**—Literature on Instant Crete, a cement pre-blended to combine all necessary additives. Photographs and specifications.

Instant Crete Corp., Dept. C&E, 1130 E. St. Georges Ave., Linden, N. J. No. 124.

**Concrete curing**—Illustrated poster informing job-site personnel of the importance of and methods used for proper curing. Covers the effects of temperature on curing and describes many curing techniques, including water spray, damp burlap, waterproof paper, and membrane-curing compounds. Form RM-124.

The Master Builders Co., division of American-Marietta Co., Dept. C&E, 2490 Lee Blvd., Cleveland 18, Ohio. No. 125.

**Pipe welder**—Brochure on O-Aircomatic pipe welder for field welding of line pipe. Tells how the process works and covers the practical benefits and equipment required. Full page of photographs shows the unit in test operations. Form ADC 927.

Air Reduction Sales Co., division of Air Reduction Co., Inc., Dept. C&E, 150 E. 42nd St., New York 17, N. Y. No. 126.

**Drill bits**—Literature on Safe-T-Bits, designed to cut only .030 with each revolution, and said to require less torque to cut, with no gouging or kickback.

Time Saver Tools, Inc., Dept. C&E, 27 E. Park Ave., Mundelein, Ill. No. 127.

**Crane-excavator**—Bulletin featuring the Koehring 605 crane-excavator, which is rated as a 1½-yard shovel and 36-ton crane. Design and construction benefits are described and illustrated.

Koehring Division, Koehring Co., Dept. C&E, 3026 W. Concordia Ave., Milwaukee 16, Wis. No. 128.

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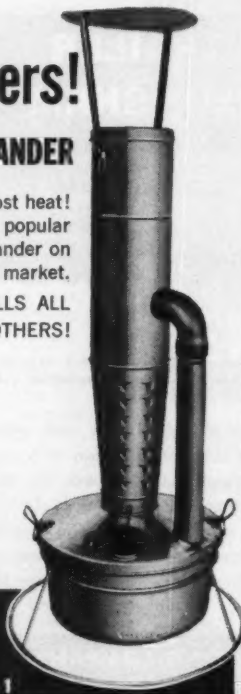
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CONTRACTORS AND ENGINEERS

Lubricant Service on construction machinery and helpful literature the 500 Cities Service 64 Wall St.,

Welding chart, inspection and welding symbols. Lenco, Inc. Adams St.,

Compact Duo-Factor graphs, drawings. Seaman Division, De Milwaukee 1

Safety Brochure on vertical climbing. Safety T Dept. C&E, Calif.

Batching and mixing control unit. Operator to mix at the out that the date, and graphically. C. S. Jo Koehring Co. 71, Champa

Bituminous describing the bituminous process with photographs. Pioneer 1 Poor & Co. Camo Ave. Minn.

Stud drilling. Fix-Rammer powder-actuating greater. Sileps, In Davidson St. lotie 3, N. C.

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Horizontal on the Ka- red boring chart and of the ma illustrations. Kwik-Mix Co., Dept. C Port Washin

Classifier describing performance of tion plant ally. Flow curves are in



**Lubricants**—Catalog from Cities Service on the lubrication of construction machinery. Photographs and helpful cutaway drawings illustrate the 50-page booklet. Cities Service Oil Co., Dept. C&E, 54 Wall St., New York 5, N. Y. No. 151.

**Welding chart**—Informative chart, especially useful for instruction and training, showing basic welding symbols. Lenco, Inc., Dept. C&E, 350 W. Adams St., Jackson, Miss. No. 42.

**Compactor**—Fact sheet on the Duo-Pactor Model 10-30 RD. Photographs, drawings, specifications. Seaman Corp., Seaman-Gunnison Division, Dept. C&E, P. O. Box 3025, Milwaukee 18, Wis. No. 36.

**Safety device for climbing**—Brochure on the Notch-Lok (now called Saf-T-Climb) safety device for vertical climbing. According to the literature, the device permits the climber to ascend or descend in perfect safety without using his hands. Safety Tower Ladder Co., Inc., Dept. C&E, P. O. Box 1052, Burbank, Calif. No. 139.

**Batch control**—Brochure describing and illustrating C. S. Johnson 60-mix batch controller and selector, a control unit that enables the plant operator to choose any one of 60 mixes at the push of a button. Points out that the selector records time, date, and batch serial number graphically on one chart. C. S. Johnson Co., division of Koehring Co., Dept. C&E, P. O. Box 71, Champaign, Ill. No. 131.

**Bituminous paver**—Booklet describing the Pioneer Vibromatic bituminous paver. Profusely illustrated with photographs and drawings. Complete specifications, Form 674-A. Pioneer Engineering, division of Peor & Co., Inc., Dept. C&E, 3200 Como Ave. S. E., Minneapolis 14, Minn. No. 133.

**Stud driver**—Fact sheet on the Fx-Rammer Control-A-Stud, a powder-actuated stud driver featuring greater control, increased safety. Sileps, Inc., Dept. C&E, 1501 N. Davidson St., P. O. Box 3721, Charlotte 3, N. C. No. 134.

**Two-way radio**—Literature describing GE's tubed and transistorized VHF 2-way radios in powers of 100 watts and less. Bulletin ECR-904. General Electric Co., Communication Products Dept., Dept. C&E, P. O. Box 4197, Lynchburg, Va. No. 135.

**Masonry-saw maintenance**—Literature on the care of masonry saws. Covers proper voltage, equipment operation and maintenance, blade selection, and good sawing techniques. Clipper Mfg. Co., Dept. C&E, 2800 Warwick, Kansas City 8, Mo. No. 136.

**Batchers**—Brochure describing the complete Erie Strayer line of cement and aggregate batchers. Shows where weighing of batches by beam scales is applicable and points out the advantages of dial automatic systems. Also gives data on how to convert existing batching equipment to new automated specifications. Erie Strayer Co., Dept. C&E, P. O. Box 1031, Erie, Pa. No. 132.

**Horizontal boring unit**—Bulletin on the Ka-Mo G-160 gasoline-powered boring unit. Presents a capacity chart and discusses in detail many of the machine's various features. Illustrations. Kwik-Mix Co., division of Koehring Co., Dept. C&E, 235 W. Grand Ave., Port Washington, Wis. No. 137.

**Classification plant**—Bulletin describing the operation and performance of a new Comco classification plant that operates automatically. Flow diagrams and accuracy curves are included. Dewatering com-

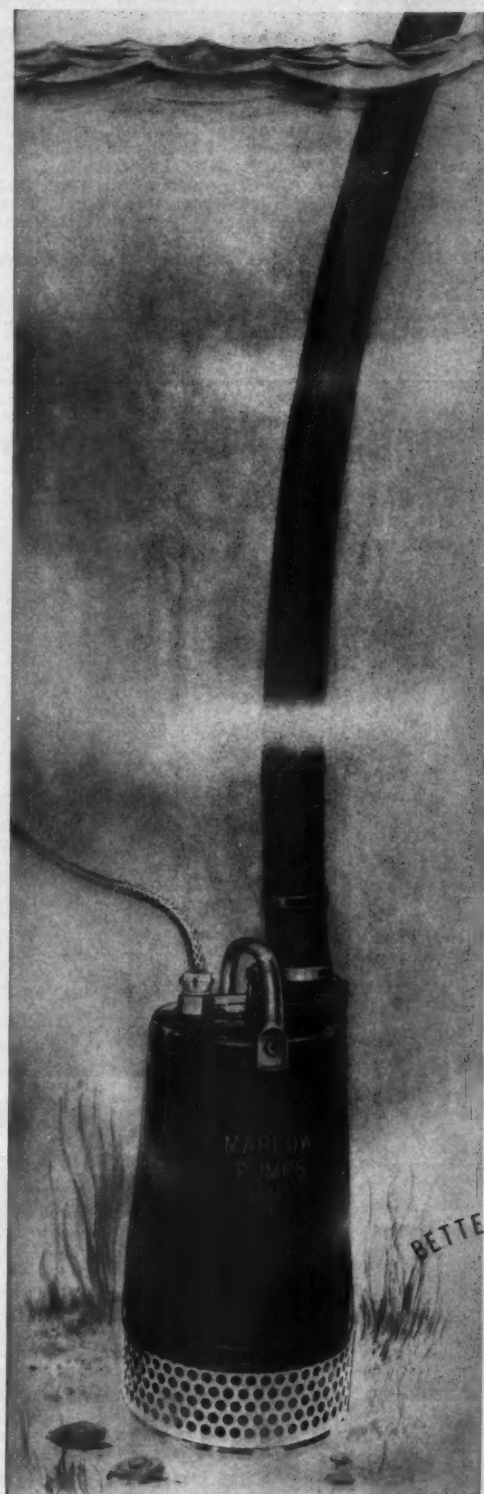
ponents described. Bulletin R-100. Comco Corp., Dept. C&E, 5421 Lancaster Ave., Philadelphia 31, Pa. No. 138.

**Arc welders**—Bulletin describing

Birdsell portable ac arc welders with a welding range from 10 to 190 amp for use on 110/220-volt lines. In addition to listing 10 important features, the bulletin also instructs on how to install, strike an arc, and

weld, and the control of heat and amperage. Bulletin 190-1. Birdsell Products, Dept. C&E, 350 N. Halstead, Pasadena, Calif. No. 139.

**Backhoe**—Folder describing the



## THE NEW MARLOW ECON-O-MERSE III

...The most advanced design  
in submersible pumps



For those tough de-watering projects where only a submersible pump can do the job, Marlow now offers a new, field tested, diffuser type submersible... the Econ-O-Merse III.

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Write today for complete specifications on the newest addition to the Marlow construction pump line—Econ-O-Merse III.

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DIVISION OF BELL & GOSSETT COMPANY

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THE ONLY HEAVY DUTY  
TRENCHER ON RUBBER  
TIRED WHEELS... WILL  
TURN IN 24' RADIUS



For real ditching mobility and versatility, a SPEICHER tandem traction trencher can't be beat. Big or small jobs, near or far, you can drive this trencher to location at speeds up to 30 M.P.H. No time consuming loading on semi. Cuts up to 6 ft. depth, from 12 to



Side mounted controls are at operator's fingertips. Permits operation from standing or sitting position, on or off the platform.

24 inches, with a digging speed of one to thirty feet per minute. Exclusive weight shifter lets you shift weight from front to back or from back to front at will. Low cost maintenance—long life. Write today for descriptive literature—we'll let the facts sell this trencher.

Dealer  
Inquiries  
Invited

Write, Phone  
or Wire

### ANCHOR SALES CORPORATION

1109 Shimp Drive, Celina, Ohio

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## Product Literature

features of the new Ottawa LX backhoe for Caterpillar wheel loaders. Gives complete specifications and provides a working-range chart for digging depth, dumping height, reach, and other dimensions. Form No. CLX-6112.

Young Spring & Wire Corp., Equipment Division, Dept. C&E, 500 Lehman Ave., Bowling Green, Ohio.

No. 140.

**Portable batch plant**—Bulletin on the Kwik Batch Model 606 portable batch plant. Photos include close-ups of important components. Specifications.

Colorado International Associates, Inc., Dept. C&E, Suite 608 Farmers Union Bldg., 16th and Sherman, Denver 3, Colo.

No. 141.

**Photo-recording highways**—Brochure on Photo/File, a system for

photo-recording highways. Lists such benefits as providing inventory of signs, roadway redesign studies, accident-pattern investigations, maintenance-needs studies, and evidence in legal actions.

Photo/File Surveys, Inc., Dept. C&E, 210 E. Courtland St., Philadelphia 20, Pa.

No. 142.

**Starting fluid**—Fact sheet on Pyroll push-button starting fluid for diesel and gasoline engines. According to the literature, this fluid gives quick starts in temperatures to 65 degrees below zero.

Pyroll Co., Inc., Dept. C&E, La Crosse, Wis.

No. 68.

**Lift trucks**—Catalog Bu-680 gives construction and operating features of seven new Allis-Chalmers F series lift trucks, including the three special FS models. Sectionalized and keyed

for quick, easy reference, the catalog contains many illustrations.

Allis-Chalmers Mfg. Co., Engine-Material Handling Division, Dept. C&E, Box 512, Milwaukee 1, Wis.

No. 50.

**Wheel loader**—Booklet describing the Lorain ML-309 Moto-Loader, a machine designed for 9,000-pound operating capacity with a wide range of reach and dump height. Well illustrated with action photographs and close-ups of major components. Bulletin No. 86780-1.

The Thew Shovel Co., Dept. C&E, 28th and Fulton Road, Lorain, Ohio.

No. 48.

**Electric cranes**—Bulletin describing the complete LeTourneau line of full-revolving, all-electric cranes. Generously illustrated; brief specifications are given on each of the units.

Bulletin No. 540.

R. G. LeTourneau, Inc., Dept. C&E, 2399 S. MacArthur, Longview, Texas.

No. 5.

**Concrete buckets**—Bulletin discussing the economy, convenience and speed of operation of double-clam and roller gate-type concrete buckets for general construction work. Tables indicate dimensions, weight and capacity of all models. Bulletin No. 2070-R1.

Blaw-Knox Co., Blaw-Knox Equipment Division, Dept. C&E, P. O. Box 1198, Pittsburgh 30, Pa.

No. 71.

**Measuring device**—Folder describing the benefits of Rolatape. Describes and illustrates three models for measuring distances on either smooth or uneven terrain. Prices.

Rolatape, Inc., Dept. C&E, Box 1190, Santa Monica 2, Calif.

No. 43.

## NOWHERE CAN YOU BUY SO MUCH PORTABLE HEAT FOR SO LITTLE!



## NEW! HERMAN NELSON HEAT GENERATORS

Hurry up heat when you want it—volume air circulation • Engineered for safe, quiet operation • Automatic ignition, automatic temperature control • 16 hours continuous operation • Burn kerosene, #1 or #2 fuel oil • Stainless steel combustion chamber • Controls and handle on cool end of machine • Complete combustion—no fumes, smoke or open flame • Use wherever you need quick, safe portable heat. A DEMONSTRATION WILL CONVINCE YOU!

America's most complete line



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Unique swirl combustor—maximum fuel economy.



Removable power pack for easy servicing.



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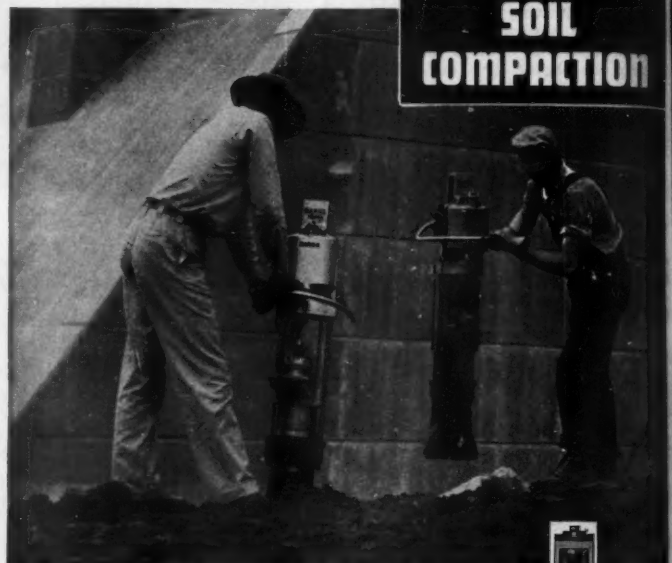
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Where SPECIFICATIONS call for . . . .

HIGH DEGREE  
SOIL  
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## BARCO RAMMERS are THE ANSWER!

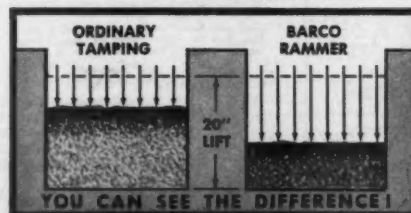
**YOU** can't get high degree SOIL COMPACTION by "patting it" or "shaking it." For deep, penetrating force to produce 95%, 97.5%, or even 100% compaction, Barco Rammers are THE ANSWER. For many soil conditions, they are the only answer.

High degree soil compaction is worth every cent it costs. Barco Rammers are especially effective for compacting fill in restricted areas—close to walls, culverts, abutments, around footings, and in trenches.

**ONE MAN OPERATION**—On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On 18" trench backfill, using lifts up to 24", the rate is 360 to 600 feet per hour.

**ASK FOR A DEMONSTRATION**—We will be glad to arrange a demonstration for you; see our nearest distributor or write.

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YOU CAN SEE THE DIFFERENCE!

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**BARCO RAMMER** for High Degree Soil Compaction  
**BARCO-VIBRA TAMP** for Granular Fill and Bituminous Surfacing

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### 2 More Ellis Money-Savers

for use with  
**ELLIS METHODS**  
of Suspended Reinforced Concrete Construction

ELLIS WALL-B-BEAR BRACK

... Ellis Methods' turnbuckle device for bracing and quick alignment of wall forms (used at either end of a wood brace), sprandel beam forms, or column forms ... nail to wood member with duplex nails, adjust with claw hammer

And ...

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The Ellis B-C-P. Clamp, adjustable from 5" to 30", proves equally effective on beam, column, or pilaster forms. No need for most cleats, whalers, scabbing, bracing, nailing ... meaning big savings on lumber!

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INCORPORATED

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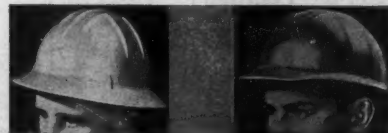
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DECEMBER, 1961

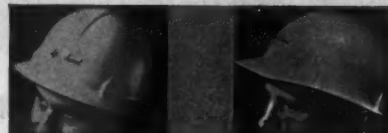
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FIBER GLASS hats (left) and caps are compression molded with polyester resins. They exceed Federal specifications. Eight colors.



ALUMINUM hats and caps are light and strong, pass Federal specifications for impact and penetration resistance. Polyethylene fixed-safety-margin headgears are easy to adjust and clean. Eight colors.



DIELECTRIC plastic hats and caps pass Edison Institute specifications for electrical resistance and Federal specifications for construction workers. Polyethylene headgear. Four colors.

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Sixteen page welding and safety equipment catalog—Write today!



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Reduce Job Costs with ...

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### Diamond MASONRY CORE BITS

Drill right through hardest reinforced concrete, tile, asphalt, etc. Cut holes to exact size on first pass. From 1" to 14" dia. Hoffman Bits are Diamond Impregnated or Surface Set ... fit any machine ... assure fast, easy installation of conduit, piping, air-conditioning units, etc.



Hoffman Bits drill 1" to 2" deep per minute on modern equipment like this new "Roto-Kor" Drilling Machine.

Kor-It Model 600 Machine swivels full 360° for any angle drilling of 1" to 5 1/4" dia. holes.

Write for Literature and Prices—FREE. Ask for information on Hoffman Diamond Segmented Circular Saws for cutting concrete, granite, etc.

**HOFFMAN BROS. DRILLING CO.**  
BOX 426, PUNXSUTAWNEY, PA.

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## Letters to the editor

### O. K. on prestressing

To the editor:

We are certainly pleased with your October issue. . . .

We have been engaged in the manufacture of prestressed concrete since 1952, and we think this is certainly the best presentation of this industry, its achievements, problems, and the future. . . .

E. R. Lacy  
Concrete Structures, Inc.  
Richmond, Va.

### Keeps in touch

To the editor:

The undersigned has for a number of years enjoyed receiving your publication . . . (and) has found the magazine of tremendous value in keeping up to date with modern methods in America. . . .

E. C. Hilder  
John Jardine, Ltd.  
Nottingham, England

### For more color

To the editor:

May I compliment you on the October issue. . . . The outside front page is an example of very fine color work. . . .

Today we are beginning to realize the advantages of using color in our homes, in our offices, in our shops. . . . Last summer I spent a lot of time in some of the manufacturing plants in Wisconsin suggesting better lighting and power distribution. I found many plant officials amenable to better lighting and decorating corridors, passages, and even shops in light greens, etc. I am doing some volunteer work in a veteran's research hospital and am very pleased to note that many of the rooms are now being repainted in light greens instead of the former somber grays. . . . Beautiful colors . . . in our homes and offices give . . . a much cheerier look to this world of ours.

Leo Dolkart, P. E.  
Chicago, Ill.

### Road Show exhibitor's brochure now available

■ The exhibitor's brochure for the 1963 Construction Equipment Exposition and Road Show is now available. Copies can be obtained from the Construction Industry Manufacturers Association, 135 S. LaSalle St., Chicago 3, Ill.

The brochure explains the new package plan and shows floor plans for the 13 acres of exhibit space. The package plan is an innovation in trade-show exhibit planning. It was devised to hold the line on mounting show costs. For the first time in the industry, all exhibit material will be F.O.B. to the exhibit space and will be spotted.

The exposition will be from February 23 to March 1, 1963, in Chicago.

CONTRACTORS AND ENGINEERS

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**IDEAL REEL INCREASES PROFITS** • By allowing user to make more ties per man hour . . . by eliminating virtually all wire waste common in other tying methods.

**IDEAL REEL INCREASES EFFICIENCY** • By simplifying tying operations (even unskilled users quickly reach peak output) . . . by dispensing wire evenly, smoothly in desired lengths.

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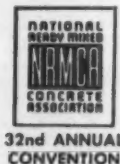
Ideal Reel Wire Coils are available in most types and gauges of wire, packed in handy cartons of 20 3 1/4 to 4 lb. coils. They load quickly, easily without tools. Right or left hand use.





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**FREE** registration and admission to users as well as producers of sand, gravel and ready mixed concrete.

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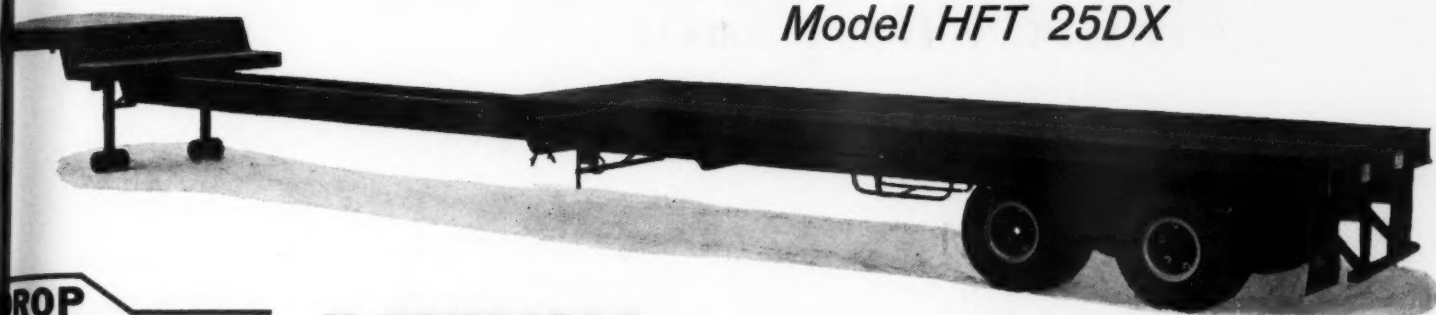
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Another NEW TRAILER by the PROGRESSIVE LEADER

# ROGERS

Model HFT 25DX

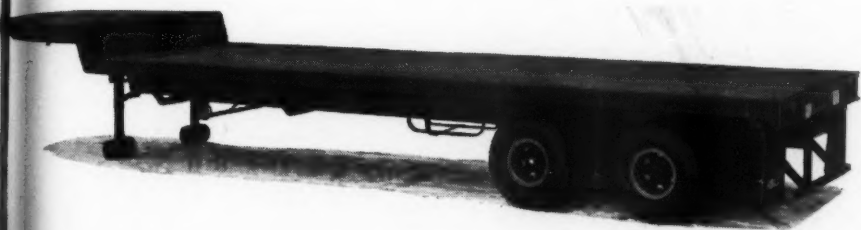


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### ~ FEATURES ~

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3. Deck height of 44" is 12" less than a conventional high flat which allows handling of higher loads without obtaining special hauling permits.
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5. It features a "foolproof" air-operated deck lock.
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44' or 53'

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They will work for you at a lot lower "cost per haul" than ever before on many of your routine and special operations.

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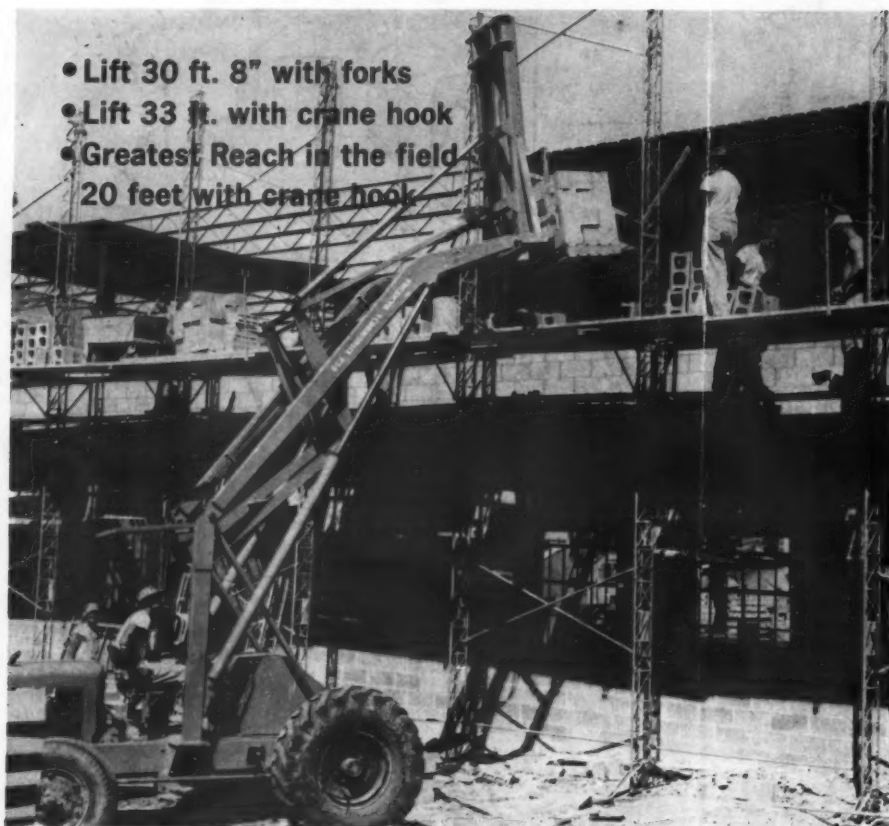
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**ROGERS TRAILERS INCORPORATED**

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# Econmobiles® and operator rent for only **\$8<sup>64</sup>** PER HOUR\*



- Lift 30 ft. 8" with forks
- Lift 33 ft. with crane hook
- Greatest Reach in the field  
20 feet with crane hook

Using an Econmobile to keep masons supplied with bricks, blocks, mortar and tile really reduces labor costs.

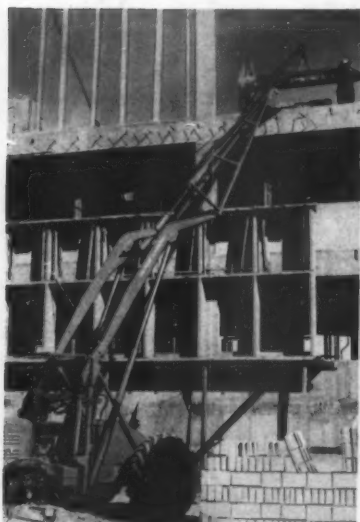
**NO WONDER... low bidding  
a profit starts with owning one.**

How many men can you hire for \$8.64 per hour? Three? How much can they do in comparison with an Econmobile jobsite materials handling vehicle? The answers are academic, because the difference is so vast. But the point is one you cannot escape—other contractors are getting profitable jobs through Econmobile mechanization. Your costs must be as low or lower and the old way won't do.

The comparison at \$8.64 per hour answers a flock of "why's." It's *why* total labor cost can be reduced 20-80%. It's *why* low bids can be made at a profit. It's *why* some contractors consider it a major reason *why* they can stay in business.

It's the reason *why* you should investigate an Econmobile before you either bid or take your next job. Be skeptical now, but get the facts that mean thousands in savings to your company.

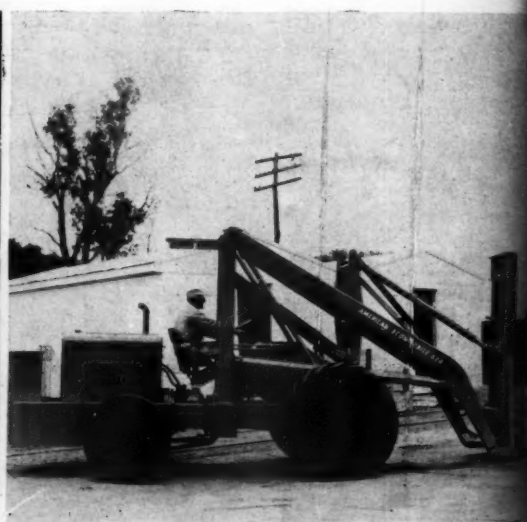
\*Includes rental, operator, gas, oil and ordinary maintenance



Light beams go up 33 feet with a crane hook attachment. So can at least 101 other things that go into a building.



In mud, snow, and around torn up sites, a power-packed Econmobile is a life saver.



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EQUIPMENT CO.**

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